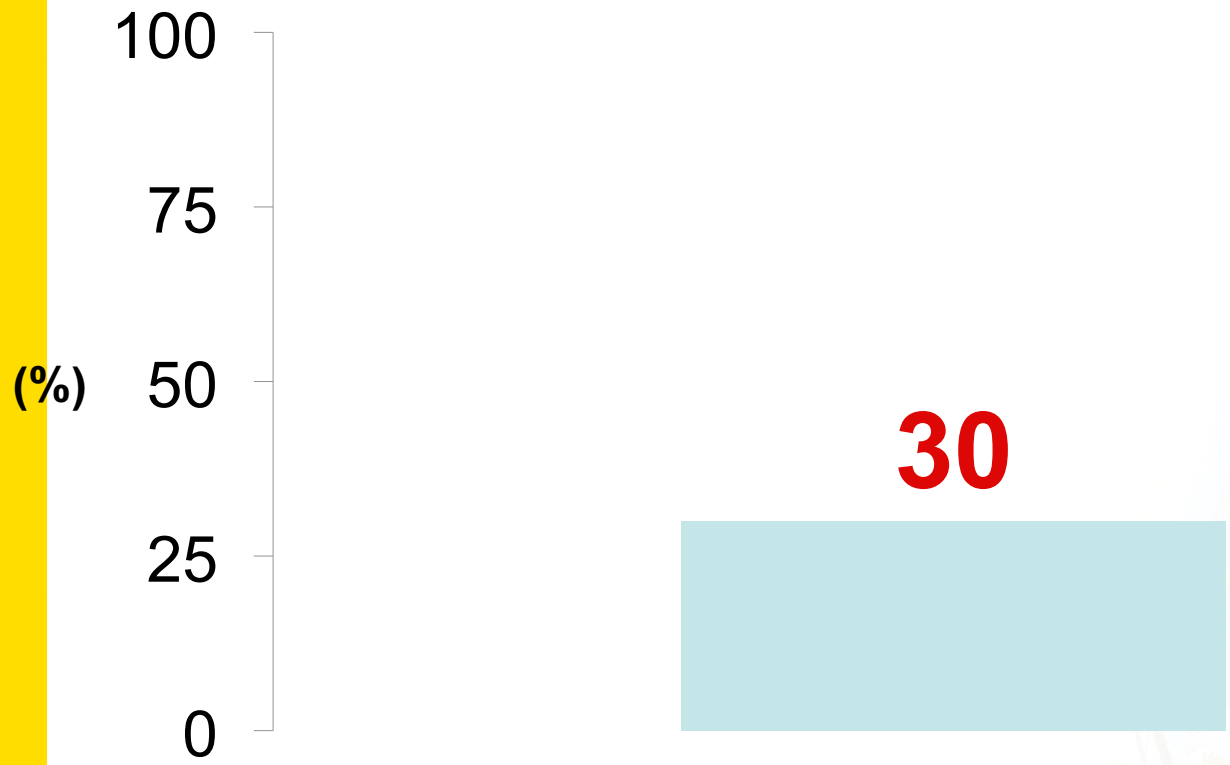
Canola Stand Establishment in 2011

By Clinton Jurke
Canola Council of Canada

Crop Establishment Workshop
Soils & Crops 2011
Saskatoon 16-March-2011

Average % Hybrid Canola Emergence

- 8 Site-years, 40 Treatments



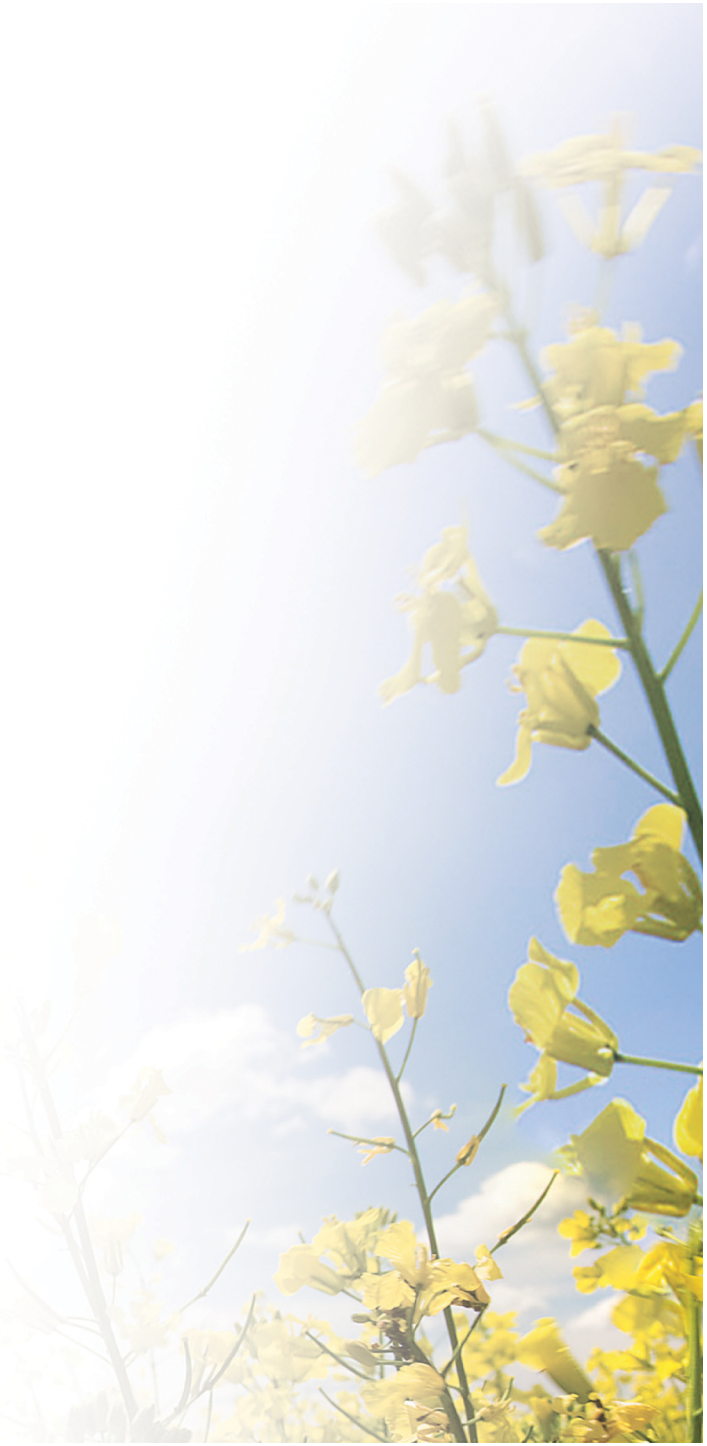
Harker et al. 2011. Unpublished data.

Keys to Being Profitable

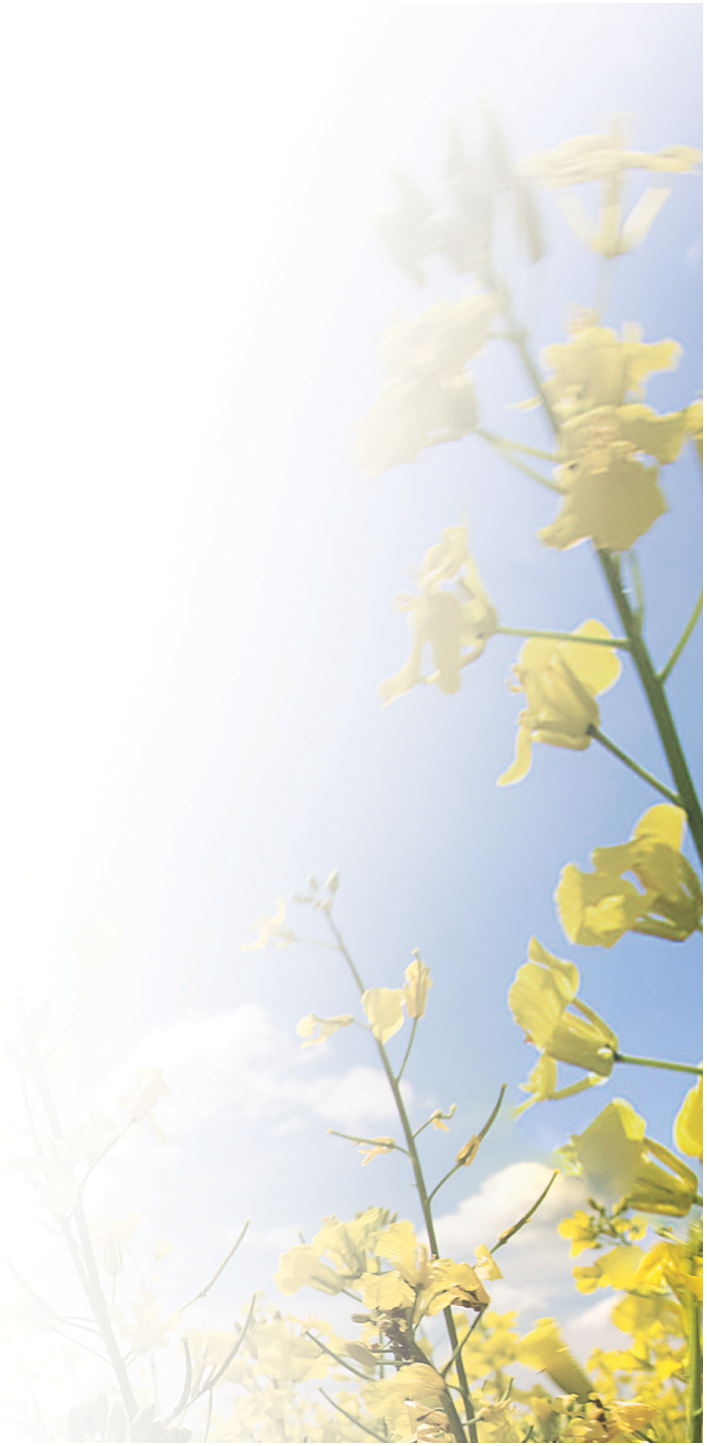
- Risk Management
- Target 10 plants/sqf
- Ensure precision in seed placement
- Target ½” to ¾” seeding depth
- Watch your speed
- Pay attention to your soil temperature
- Use good quality seed

Outline

- The Risks
- The Target
- The Factors



The Risks



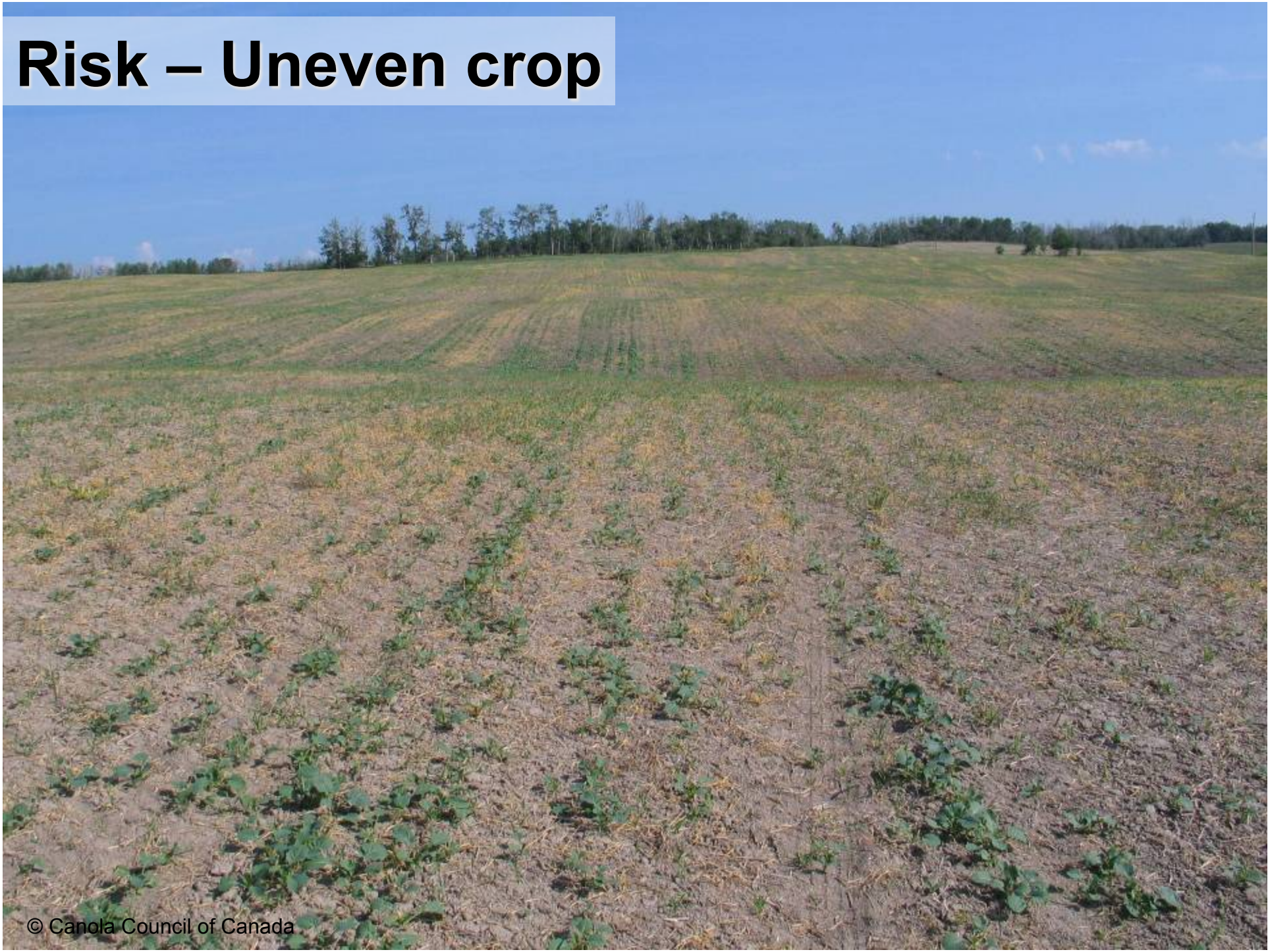
Risk – Bad weather

Risk – Diseases

Risk – Insects

Risk – Insects

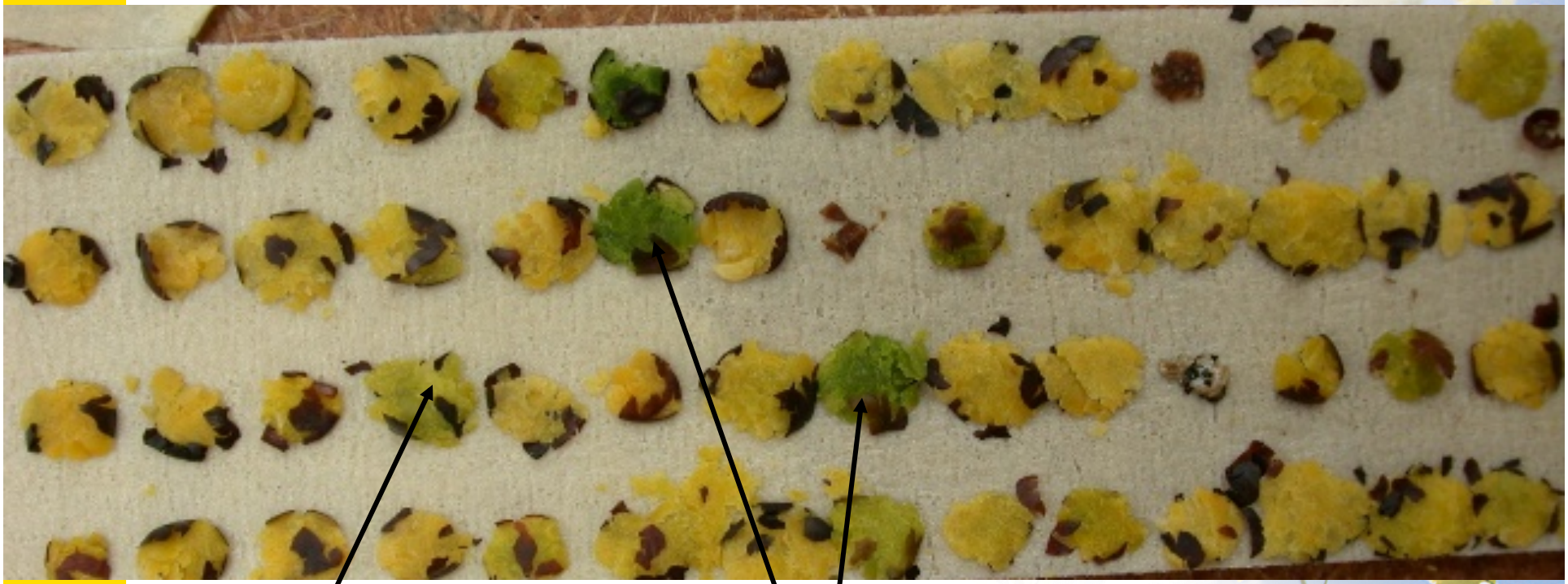
Risk – Uneven crop



Risk – Uneven crop

Fall Frost (Aug. 19th, 2004)

Risk – Uneven crop



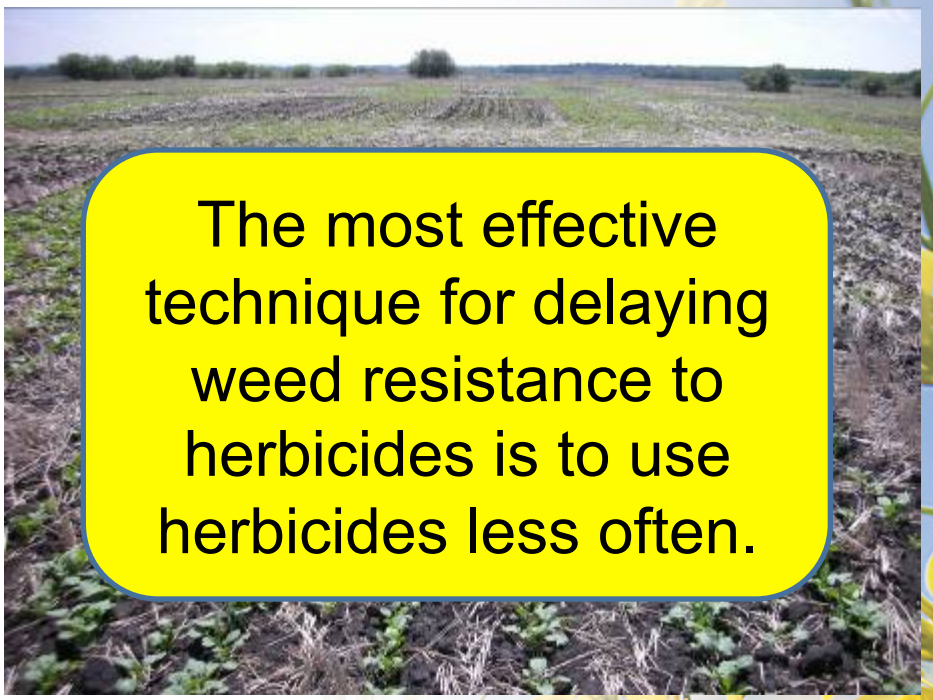
Not DGR

Distinctly green seeds
(DGR)

Risk – Weed Resistance

Hybrid
4 mph
1 cm

Hybrid
4 mph
4 cm



The most effective technique for delaying weed resistance to herbicides is to use herbicides less often.

June 7 (April seeded)

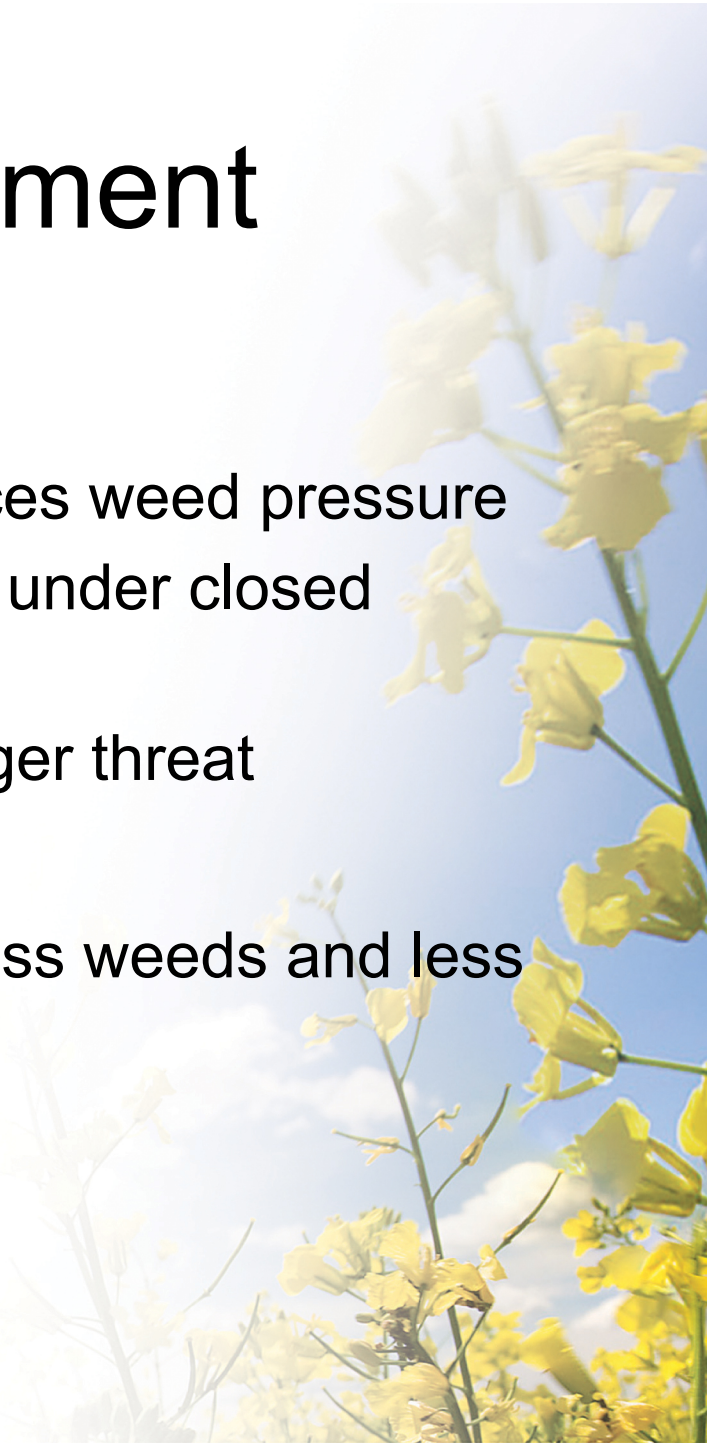
Photos courtesy of N. Harker

http://www.nytimes.com/2010/05/04/business/energy-environment/04weed.html

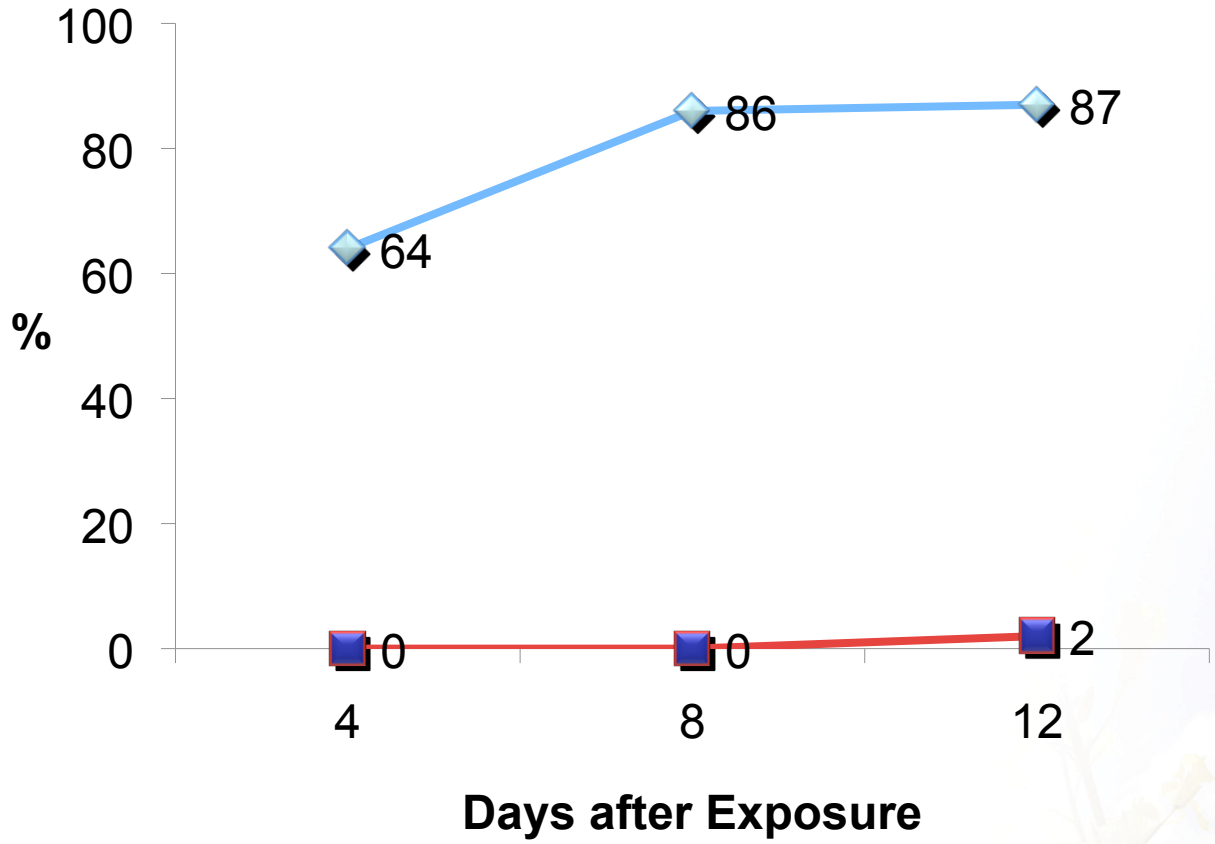
Farmers Cope With Roundup-Resistant Weeds

Weed Management

- Knowns
  - Competitive crop canopy reduces weed pressure
  - Some weeds do not germinate under closed canopies
  - Weed resistance becoming larger threat
- Solutions
  - Better stand establishment = less weeds and less selection pressure
  - Rotate herbicides

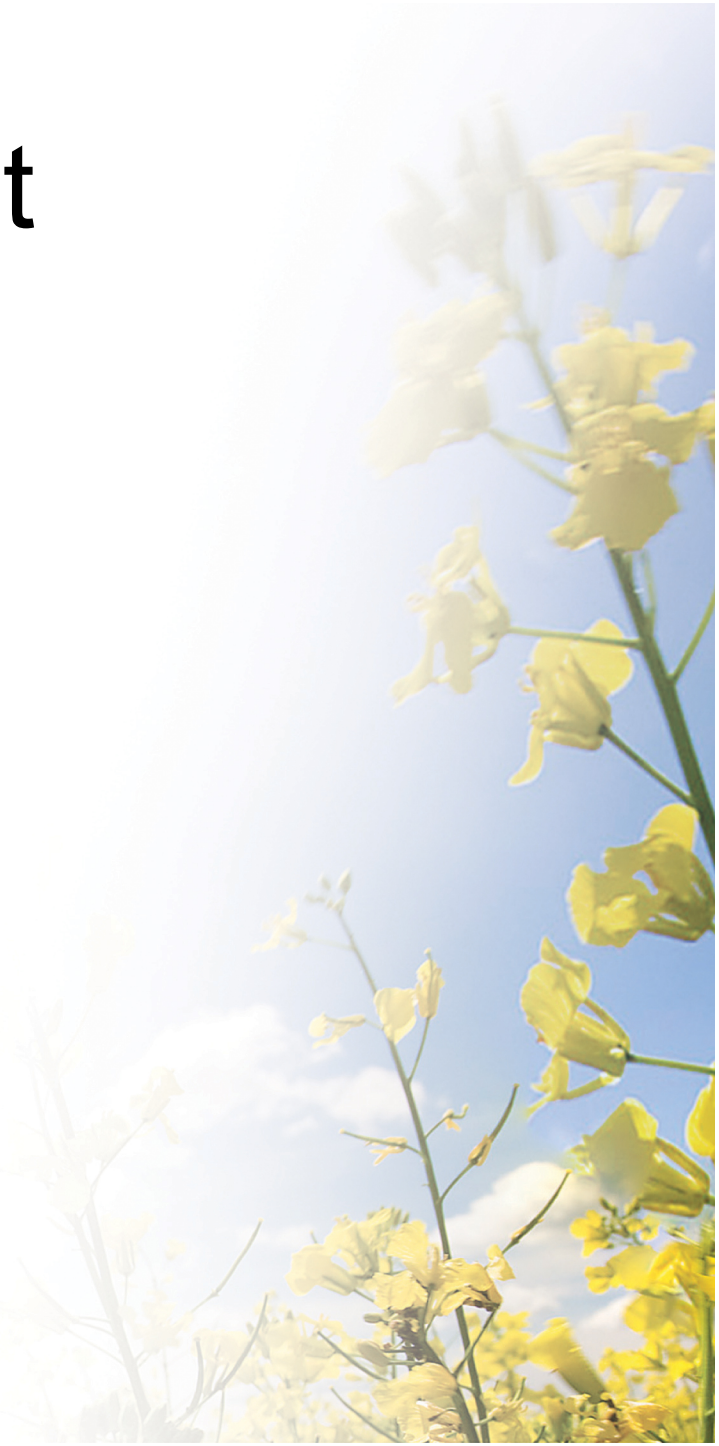


Dandelion Germination - with 2 light sources

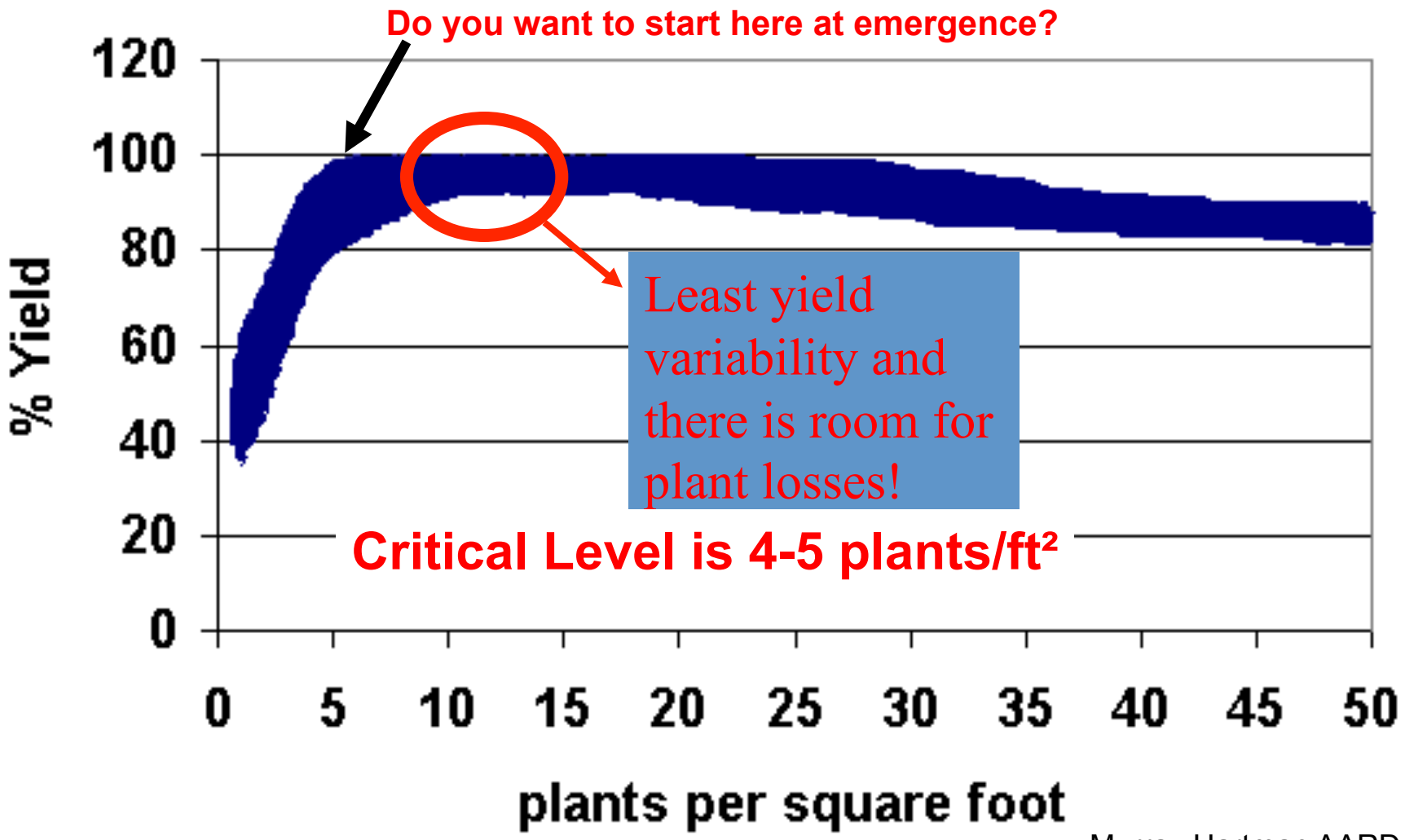


T. Górski. 1975. Germination of seeds in the shadow of plants. Physiol. Plant 34:342-346
- rhubarb, rye, barley, dense currant, and wild shrubs canopies

The Target

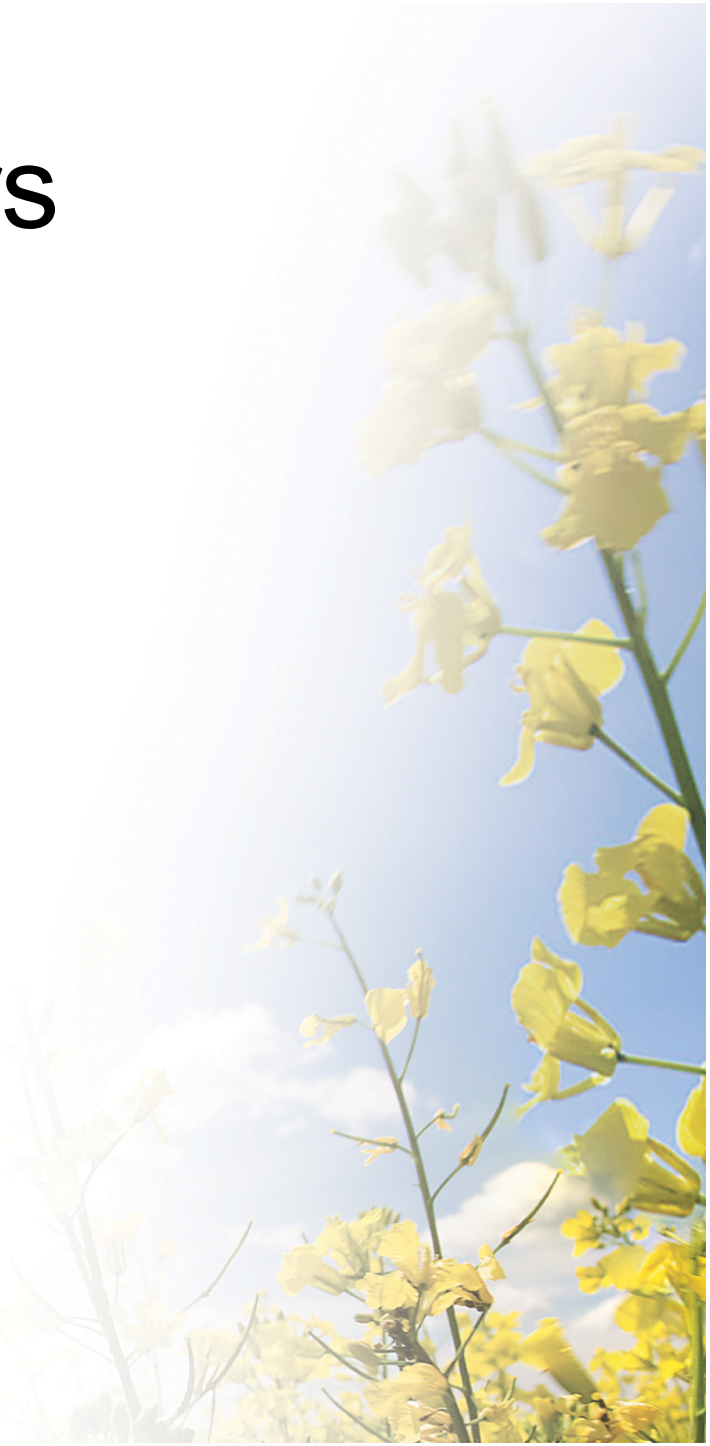


General Response of Canola Yield to Plant Population

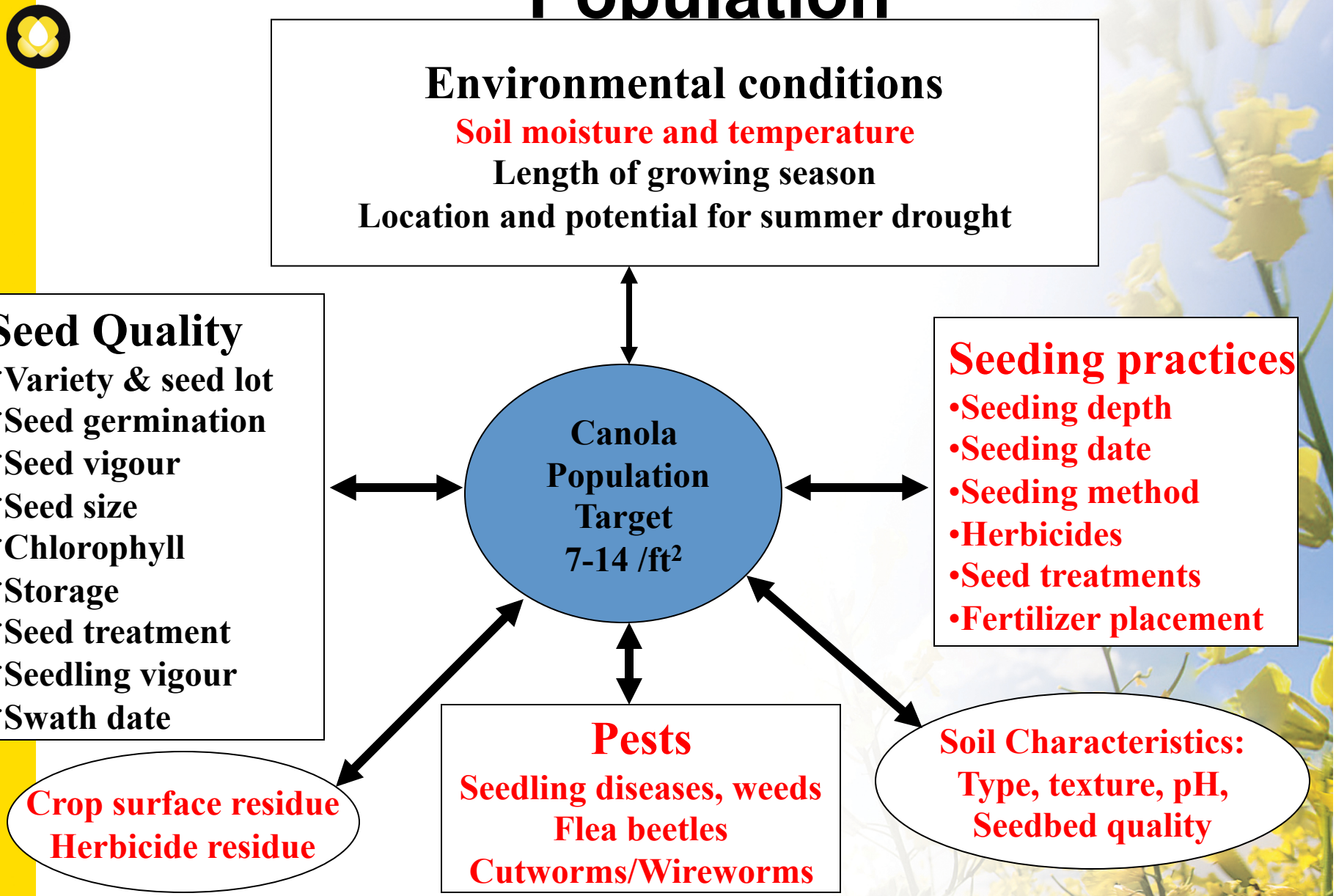


Murray Hartman AARD 2005

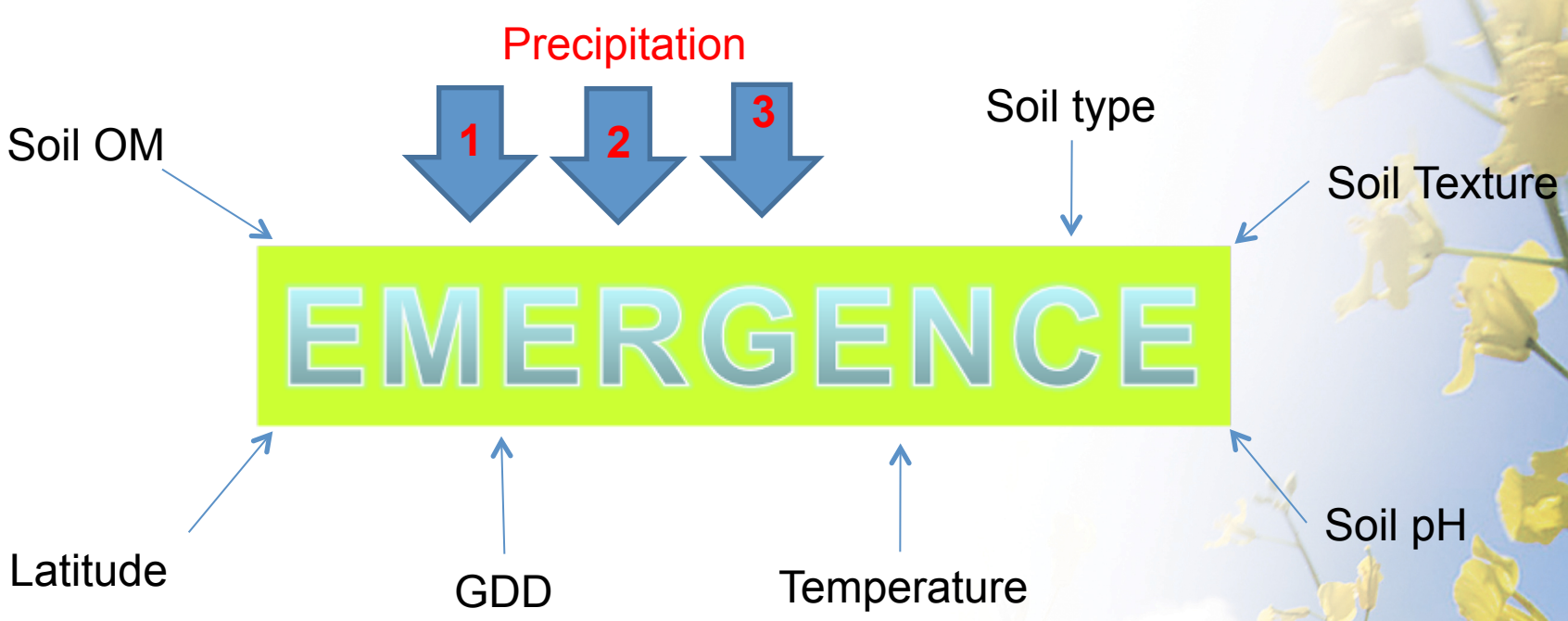
The Factors



Factors Affecting Plant Population



Neural Net Prediction of Canola Emergence



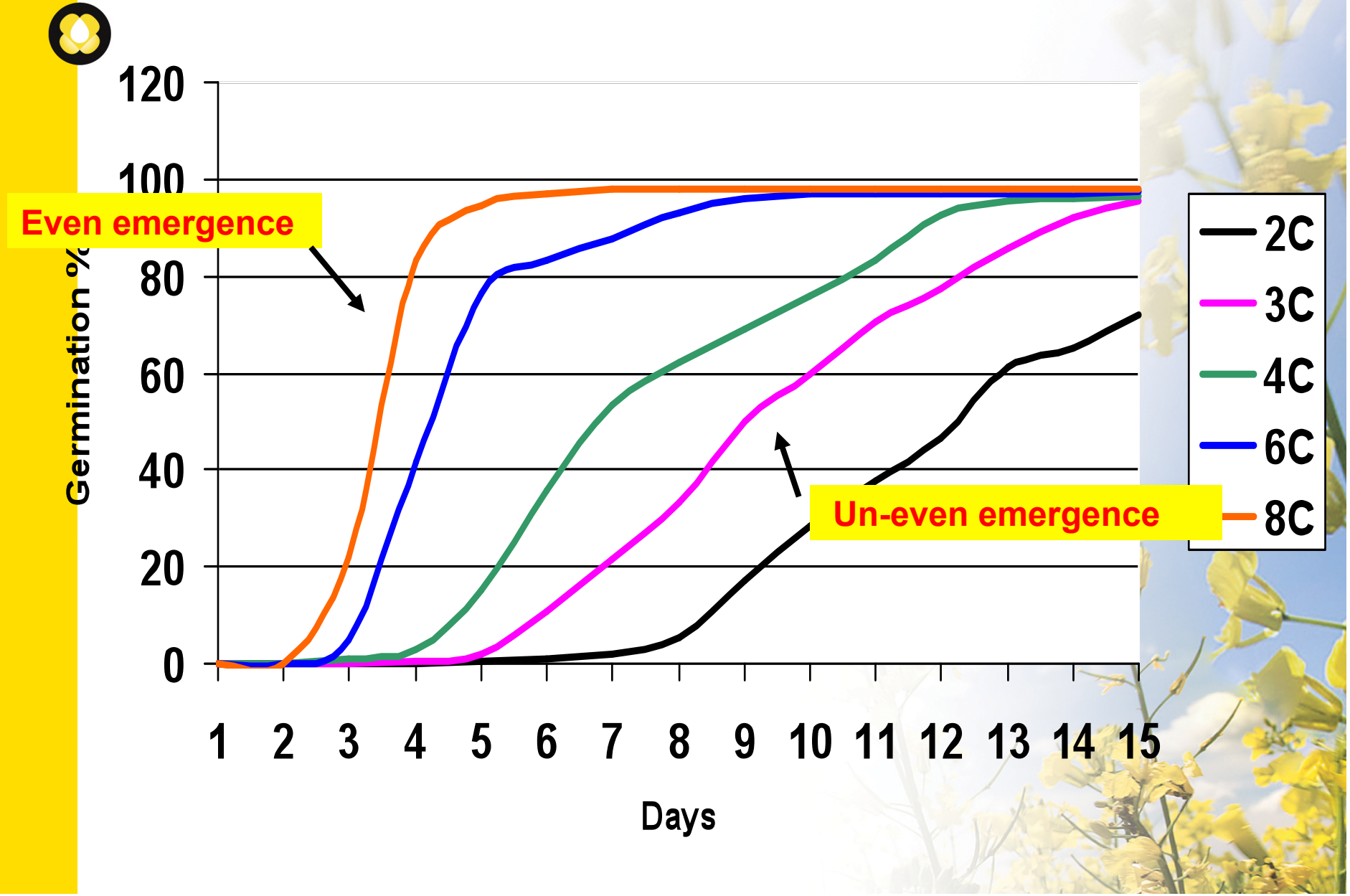
Bernie Hill – AAFC, Lethbridge

Effect soil type and moisture content on *B. napus* emergence

Soil type	6 days		13 days	
	50% FC	100% FC	50% FC	100% FC
Loam/Sandy Clay	0	94	59	93
Clay loam/ Sandy Clay	77	75	88	91
Grey Wooded/ Clay	0	74	5	90
Sand/Sandy Loam	0	30	0	70

Nutall.1982. Agronomy Journal. 74:1018-1022

Effect of Soil Temperature on emergence



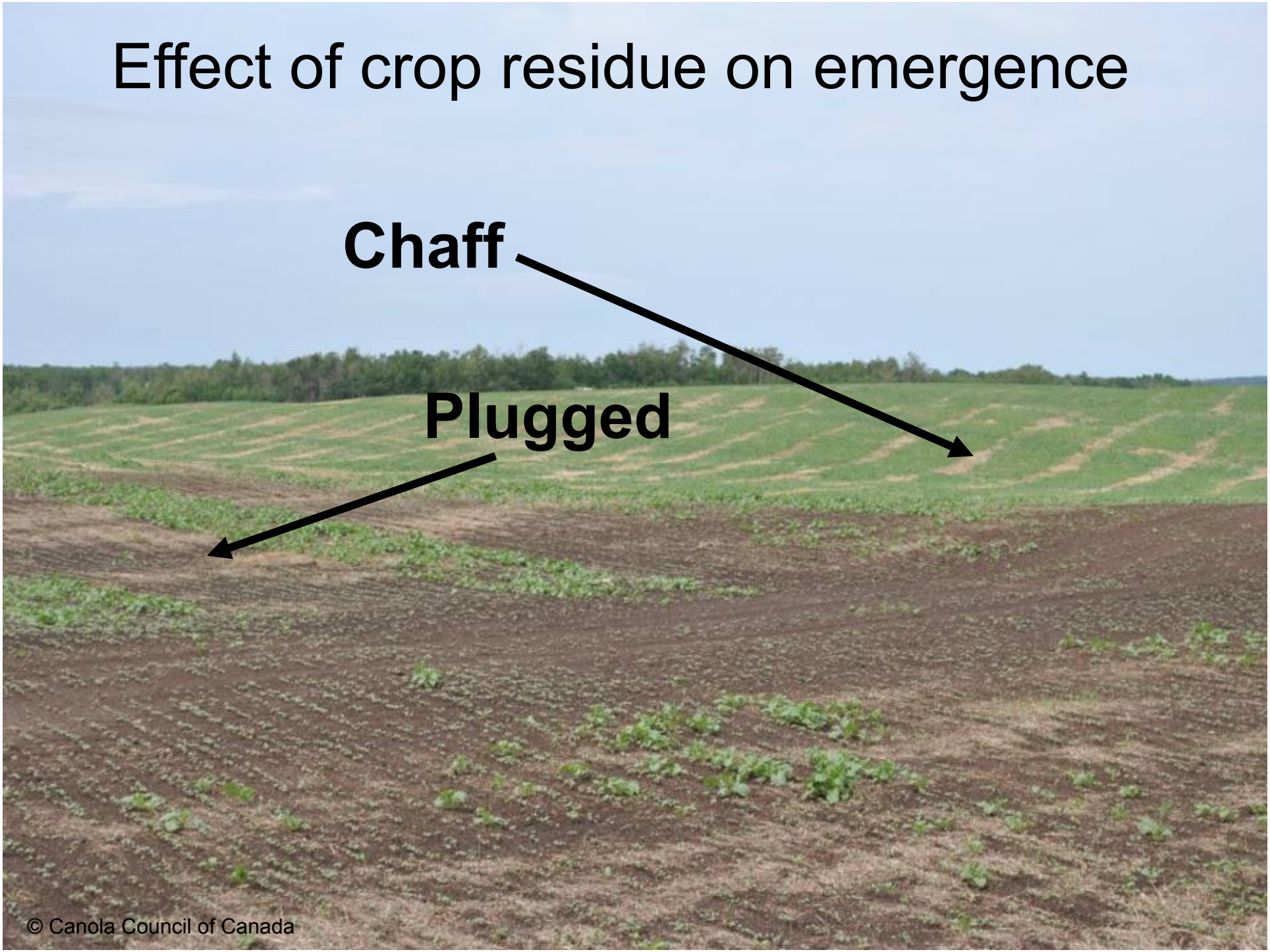
Effect of soil crusting on emergence

Effect of crop residue on emergence

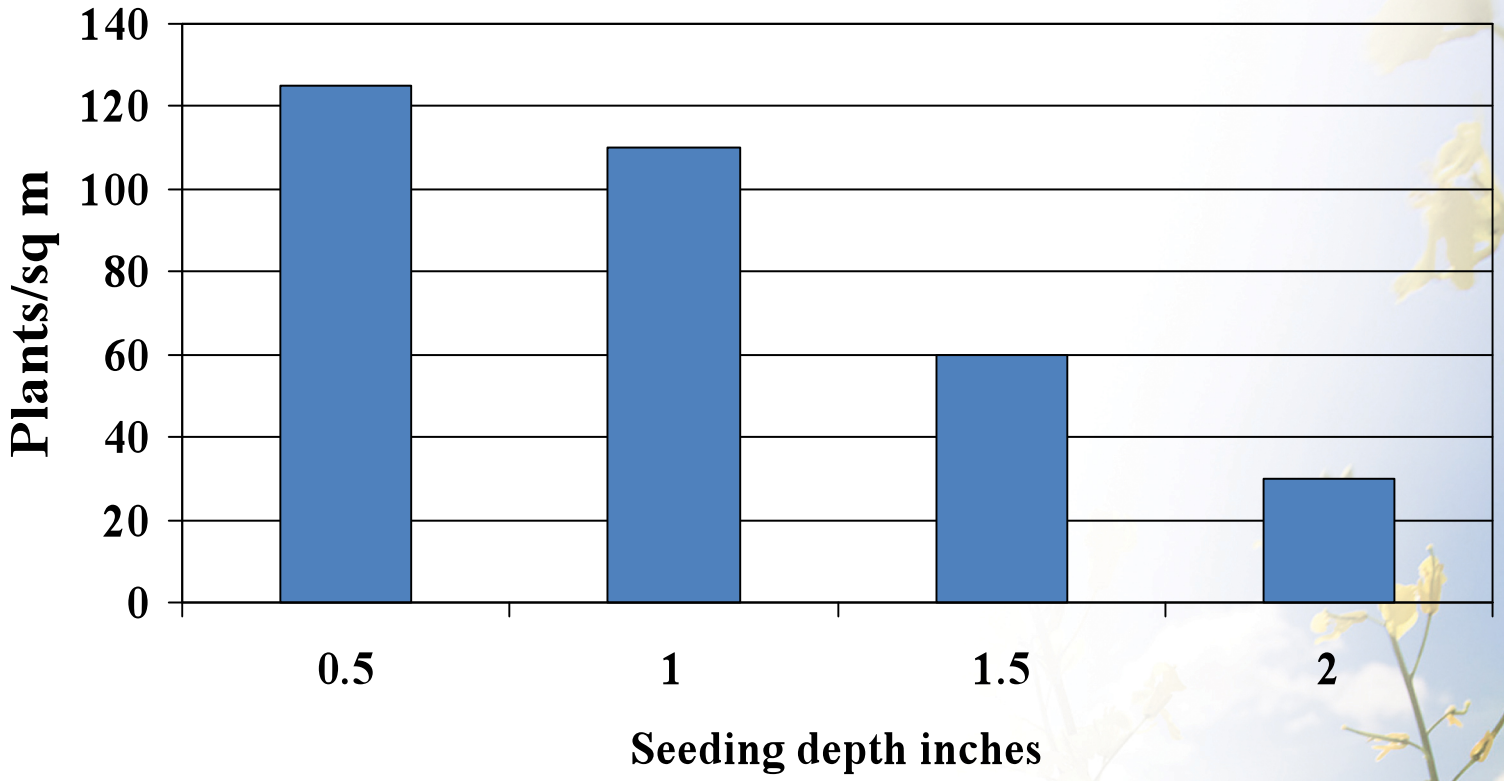
- Straw/chaff are an issue for small-seeded crops
- Has an effect on soil temp and seed-to-soil contact
- Successful residue management involves starting the previous fall
  - Spread width of straw & chaff should equal width of cut by swather or straight cut header
- Heavy harrows to spread straw in the fall or early spring can be useful
  - but watch aggressiveness

Effect of crop residue on emergence

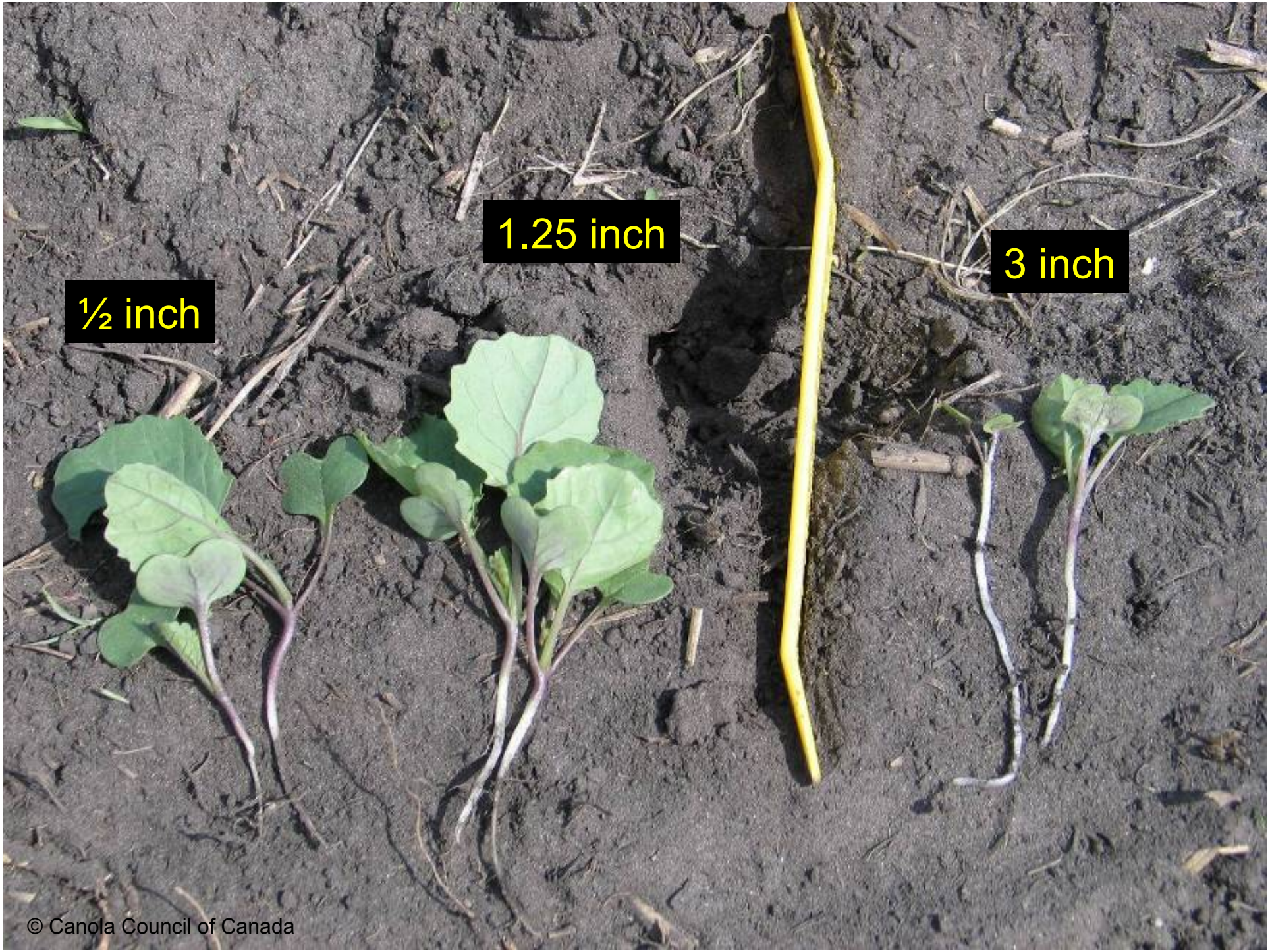
Effect of crop residue on emergence



Effect of Seeding Depth on Canola Emergence



Summary of Canola Council's Canola Production Centre Data, 2003



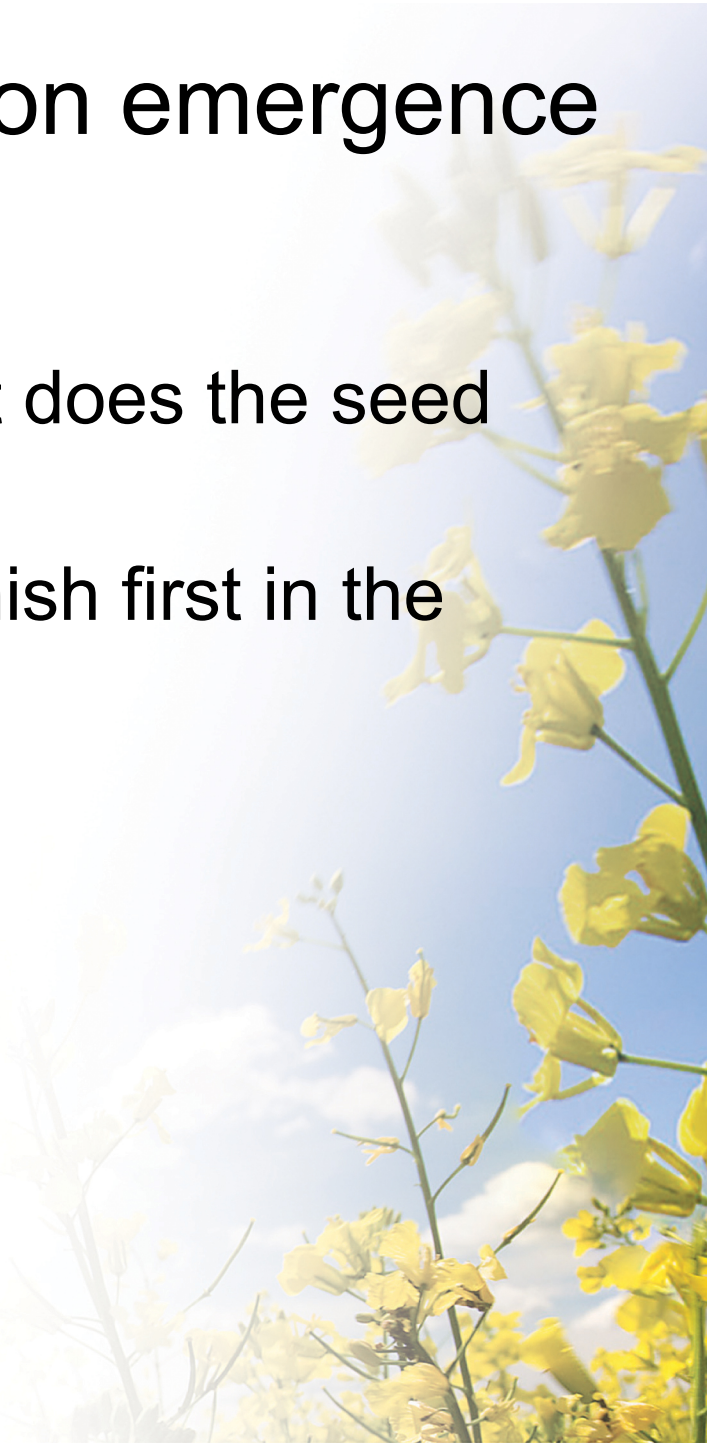
Effect soil type and seeding depth on *B. napus* emergence

Soil type	6 days		13 days	
	1.5 cm (1/2”)	3.0 cm (1”)	1.5 cm	3.0 cm
Loam/Sandy Clay	34%	11%	90%	59%
Clay loam/ Sandy Clay	15%	16%	90%	65%
Grey Wooded/ Clay	0%	0%	65%	35%
Sand/Sandy Loam	13%	1%	71%	36%

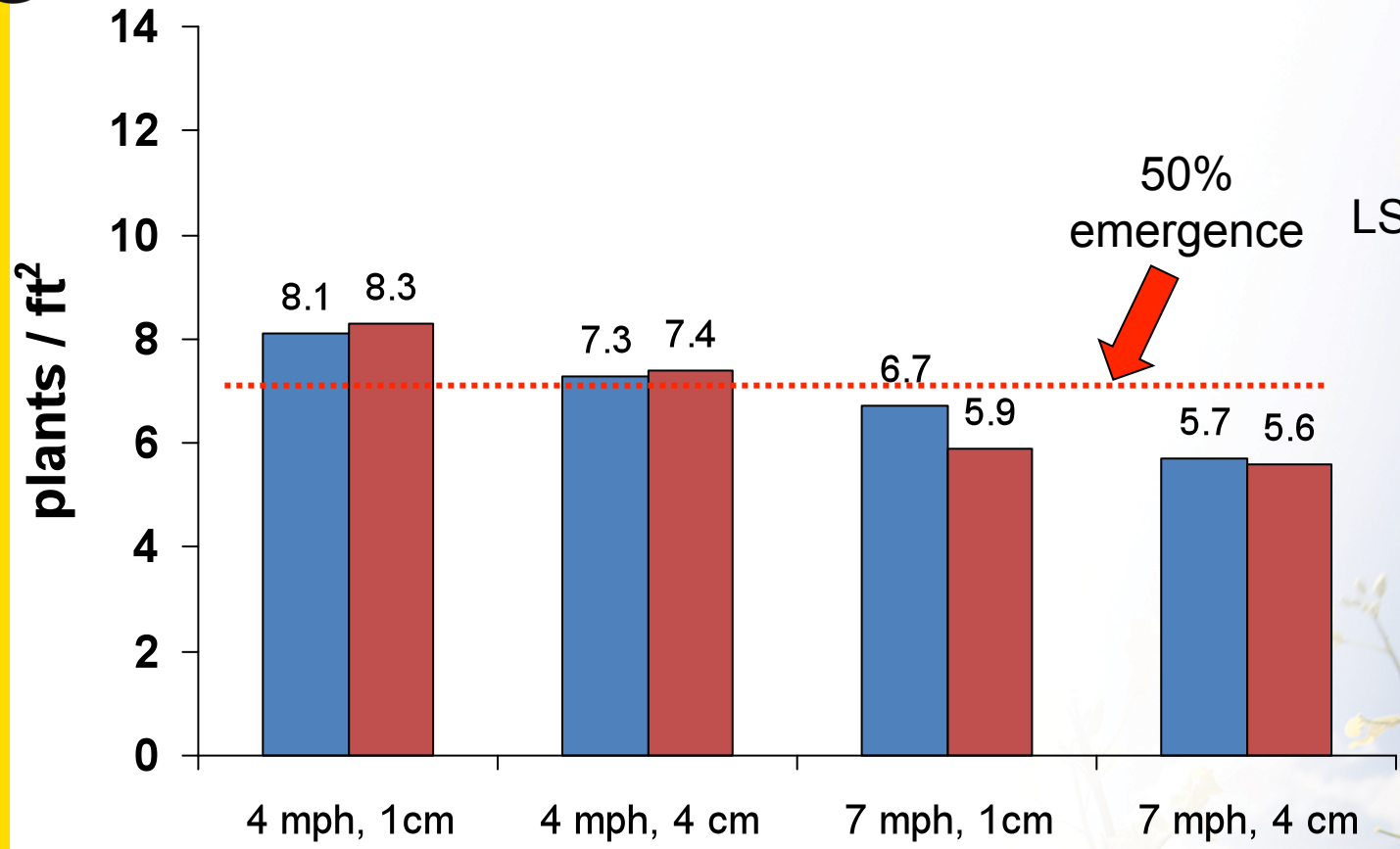
Nutall.1982. Agronomy Journal. 74:1018-1022

Effect of seeding speed on emergence

- You may be finished first but does the seed yield come with it?
- Or does slowing help you finish first in the bin?



Effect of seeding speed on emergence



LSD (0.05) = 1.7

Hybrid

OP

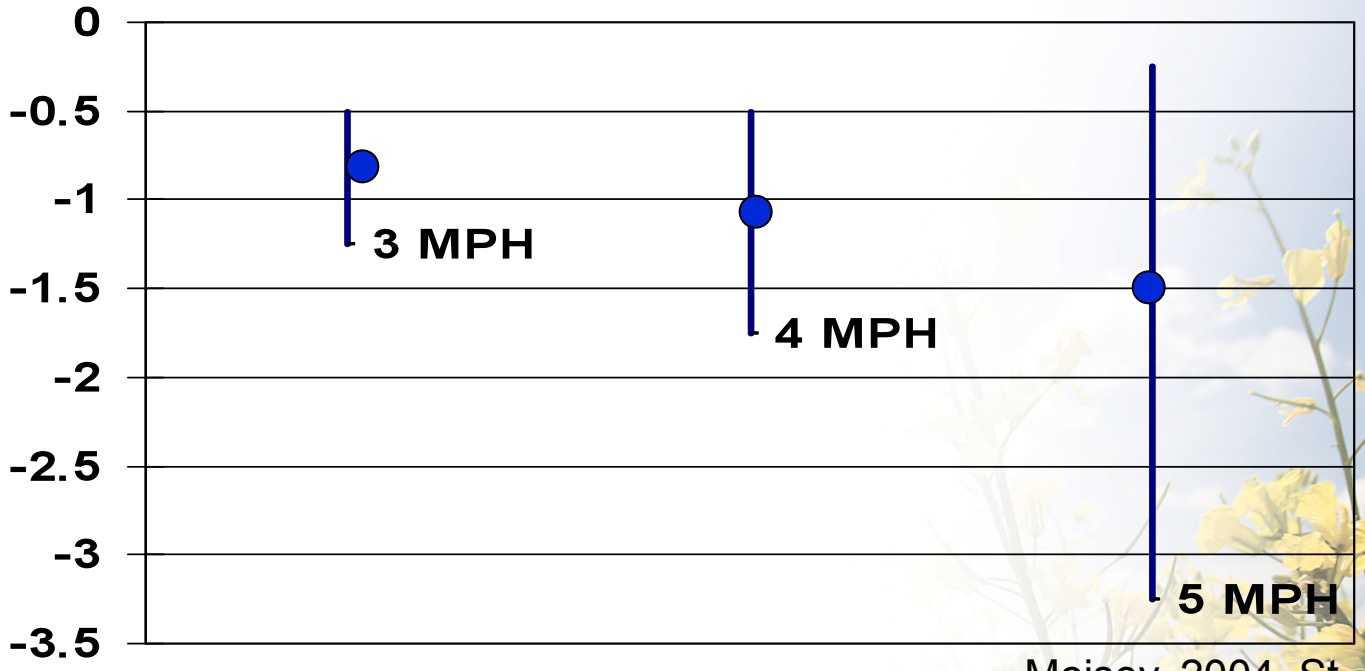
Hybrid = 71-45 RR
OP = 34-65 RR

Seeding Rate: 14 seeds/ft^2

AAFC Lacombe - 2007

Effect of seeding speed on emergence

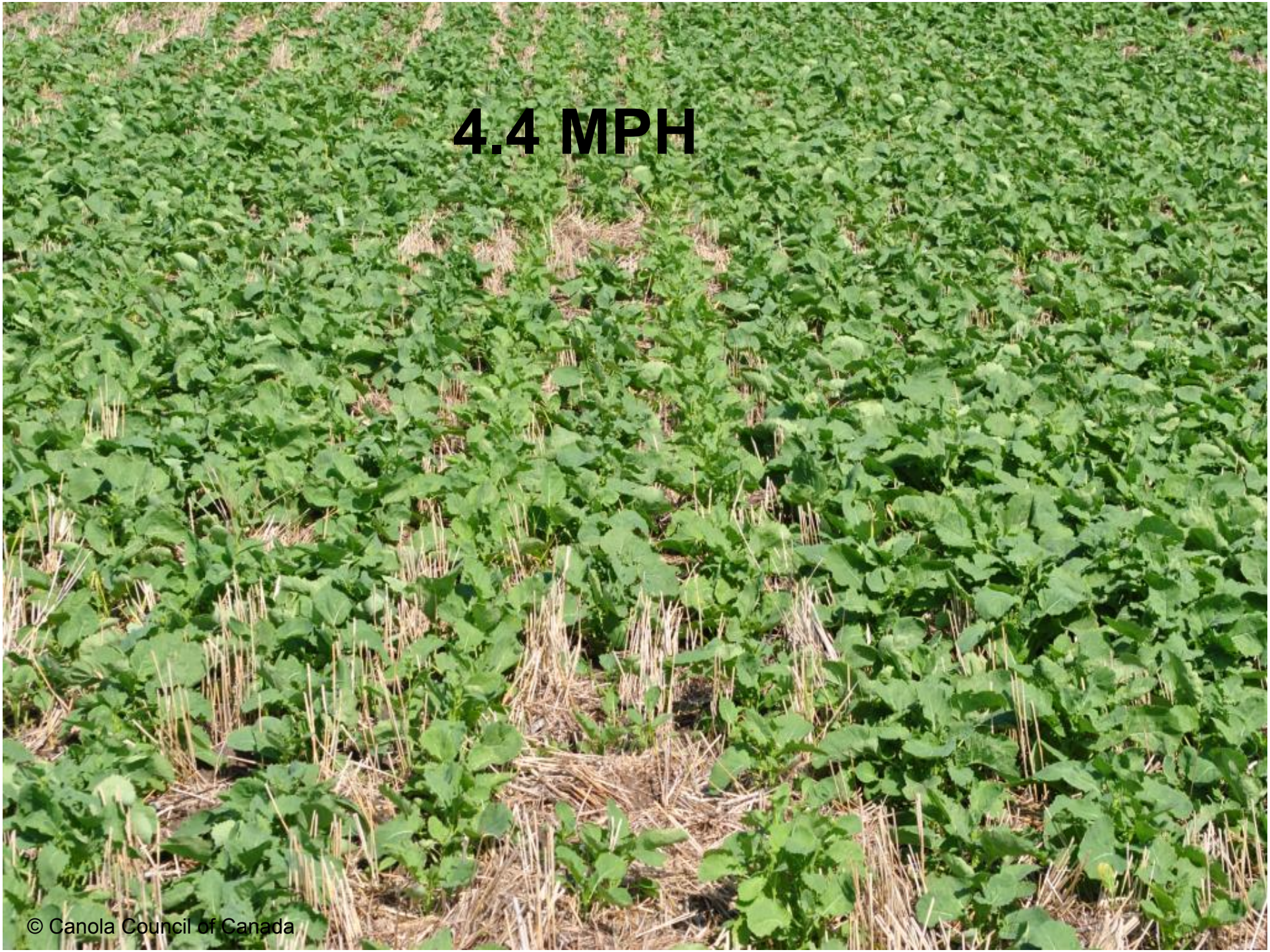
Seeding Speed	Avg. Depth	Range of Depth
3 MPH	¾”	0.5-1.25”
4 MPH	1”	0.5-1.75”
5 MPH	1.5”	0.25-3.25”



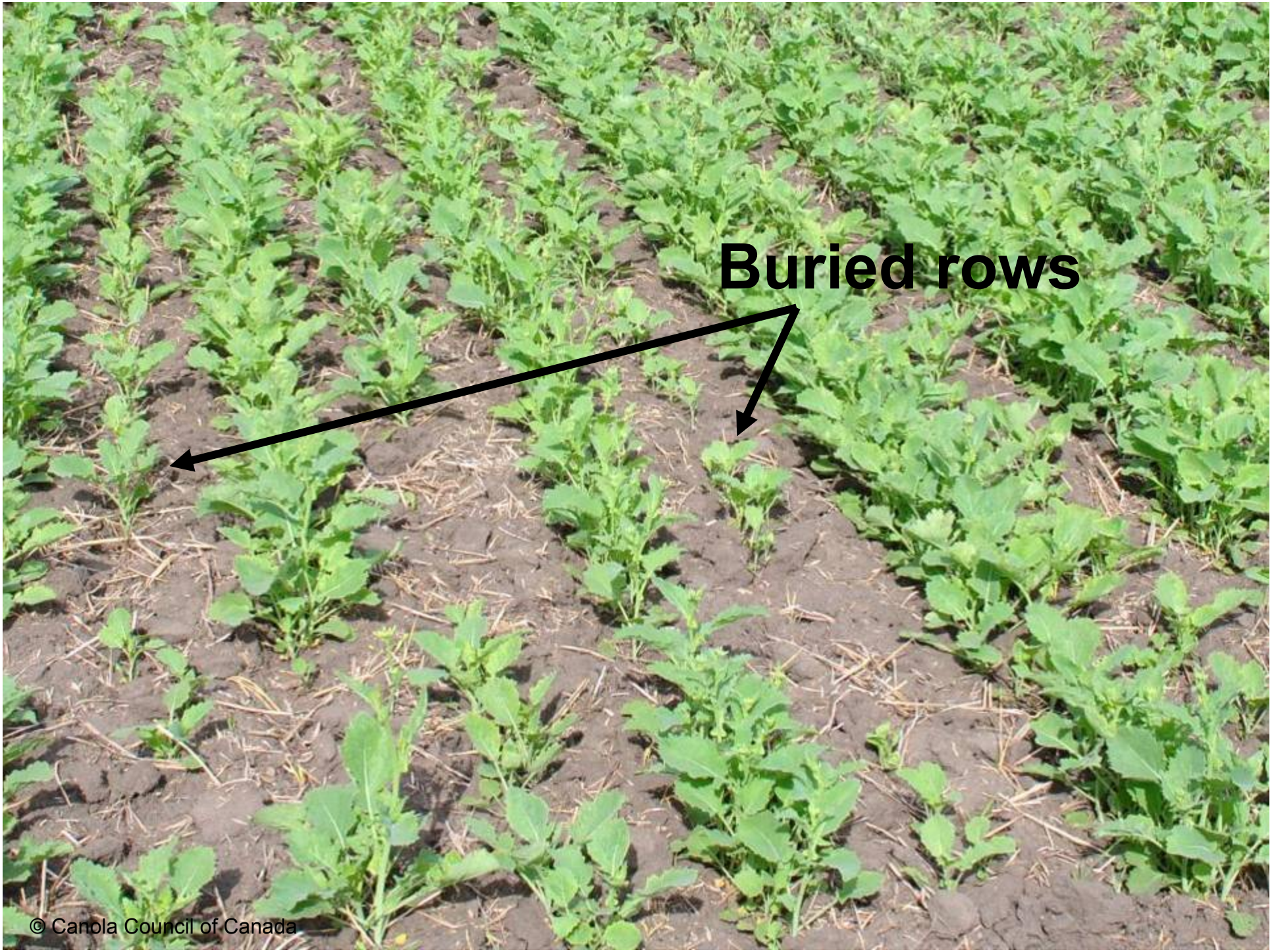
Moisey. 2004. St. Paul

Stubble disturbance @ 5.3 mph

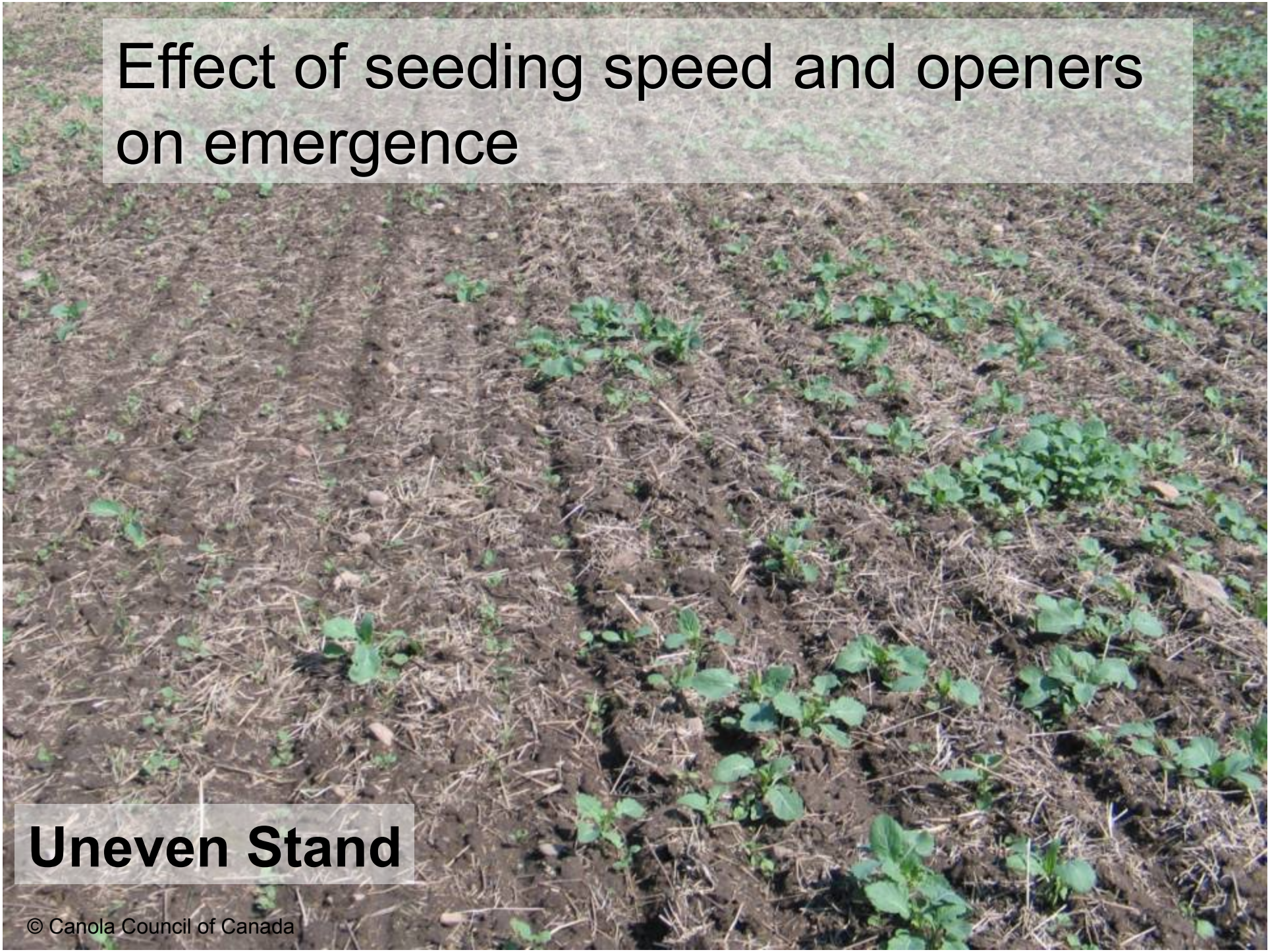
Same Speed 4.4 mph



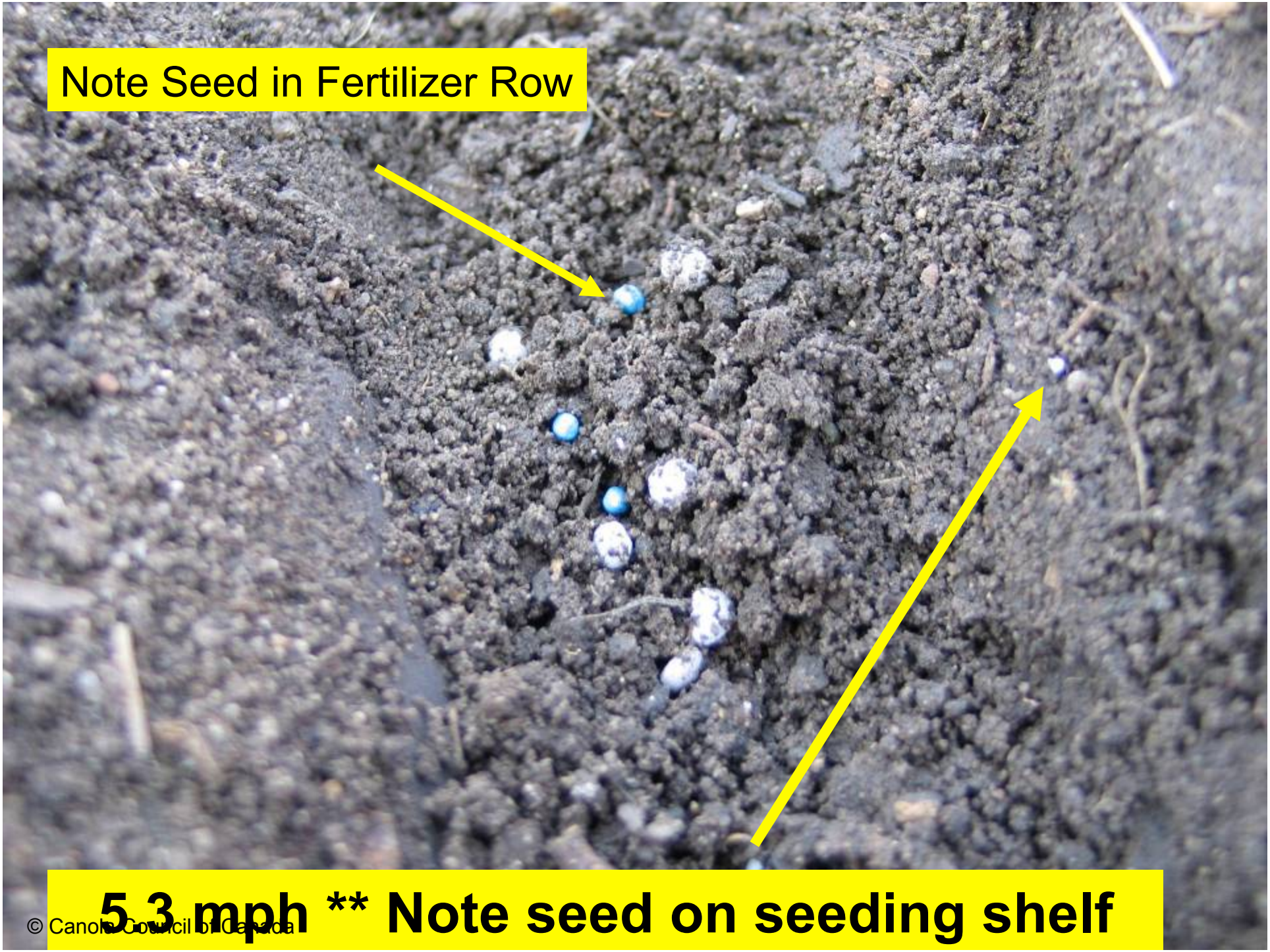

4.0 MPH
© Canola Council of Canada



Effect of seeding speed and openers on emergence

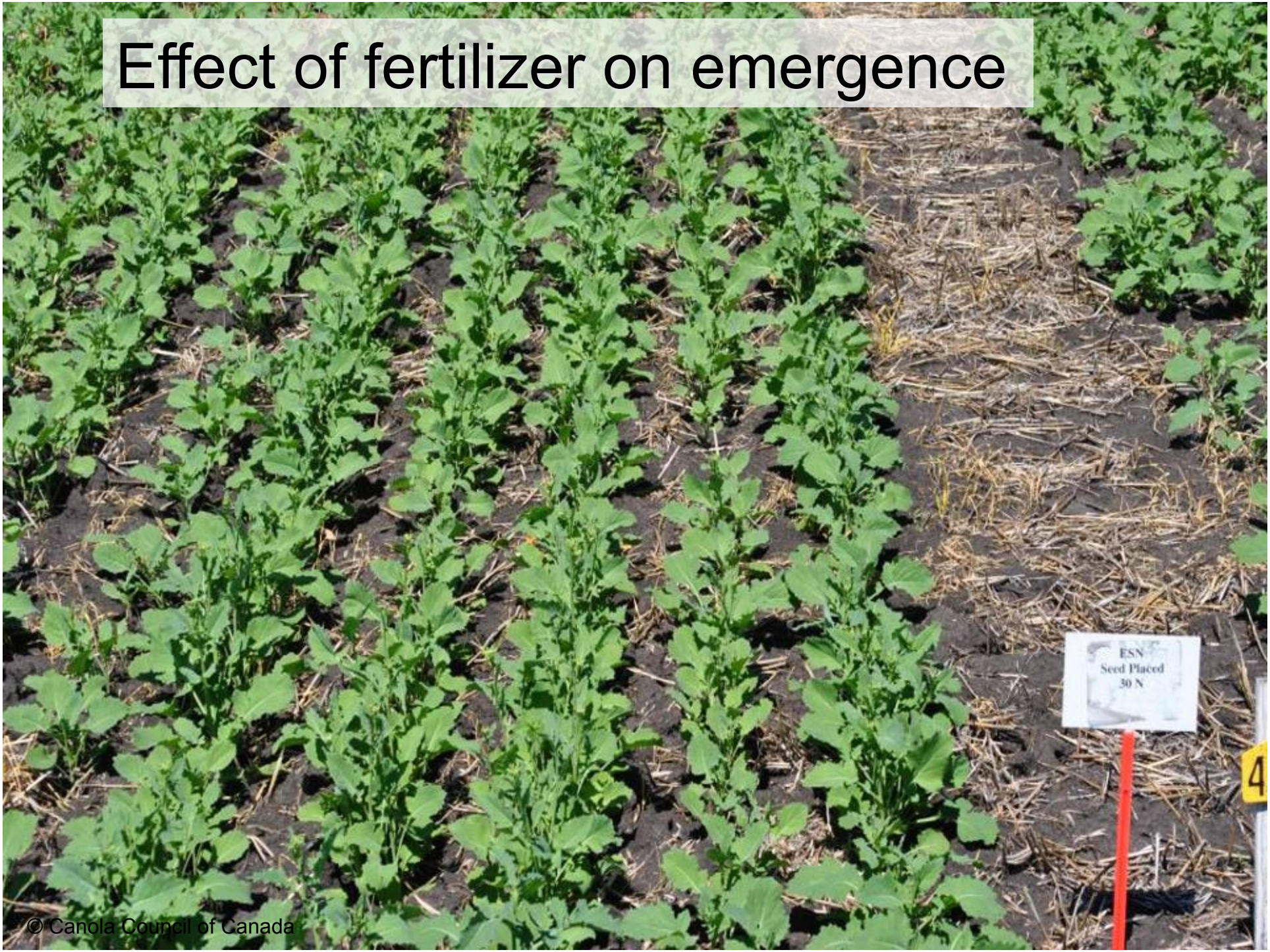


Uneven Stand

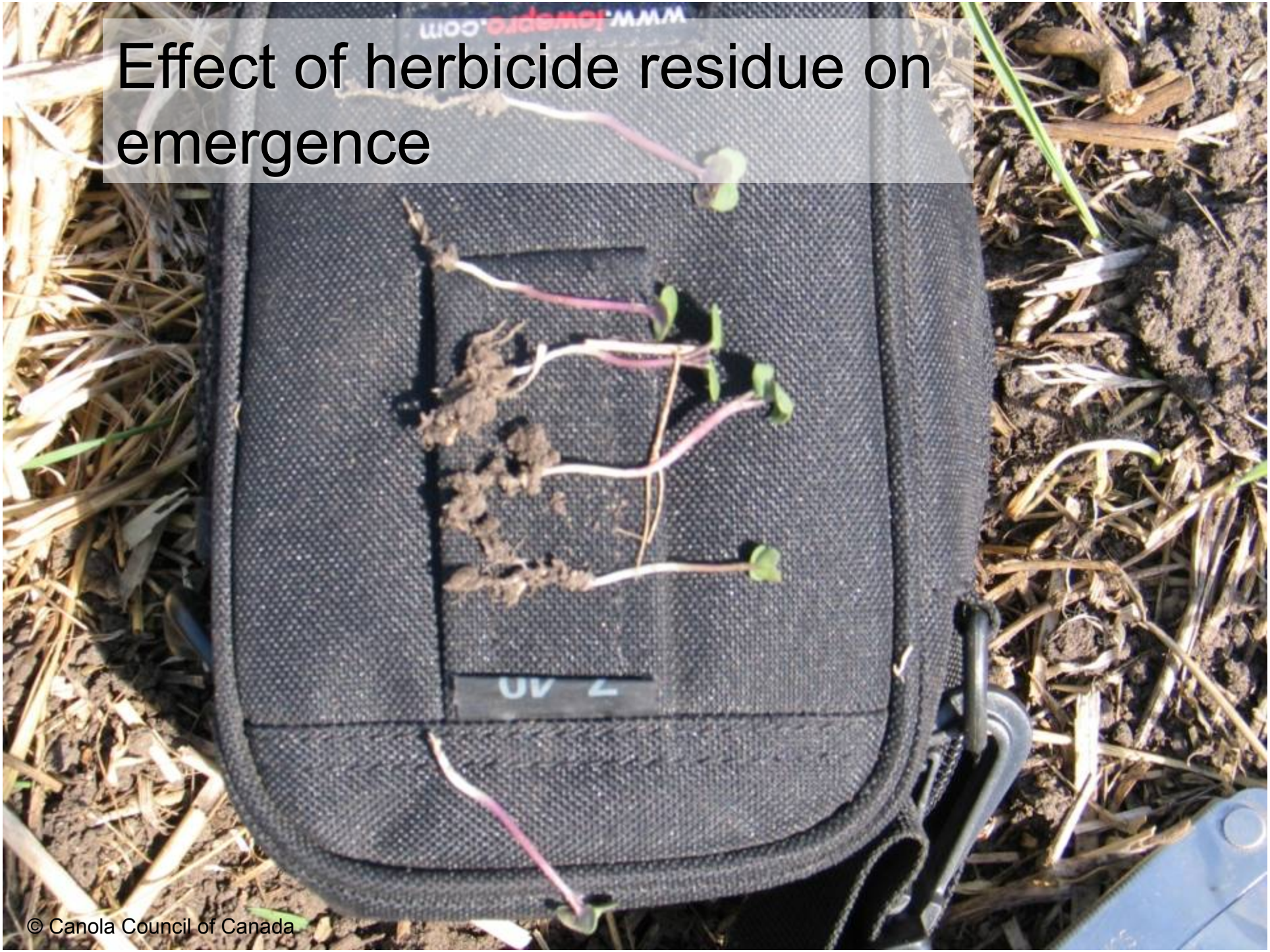


Effect of fertilizer on emergence

Effect of fertilizer on emergence



Effect of herbicide residue on emergence



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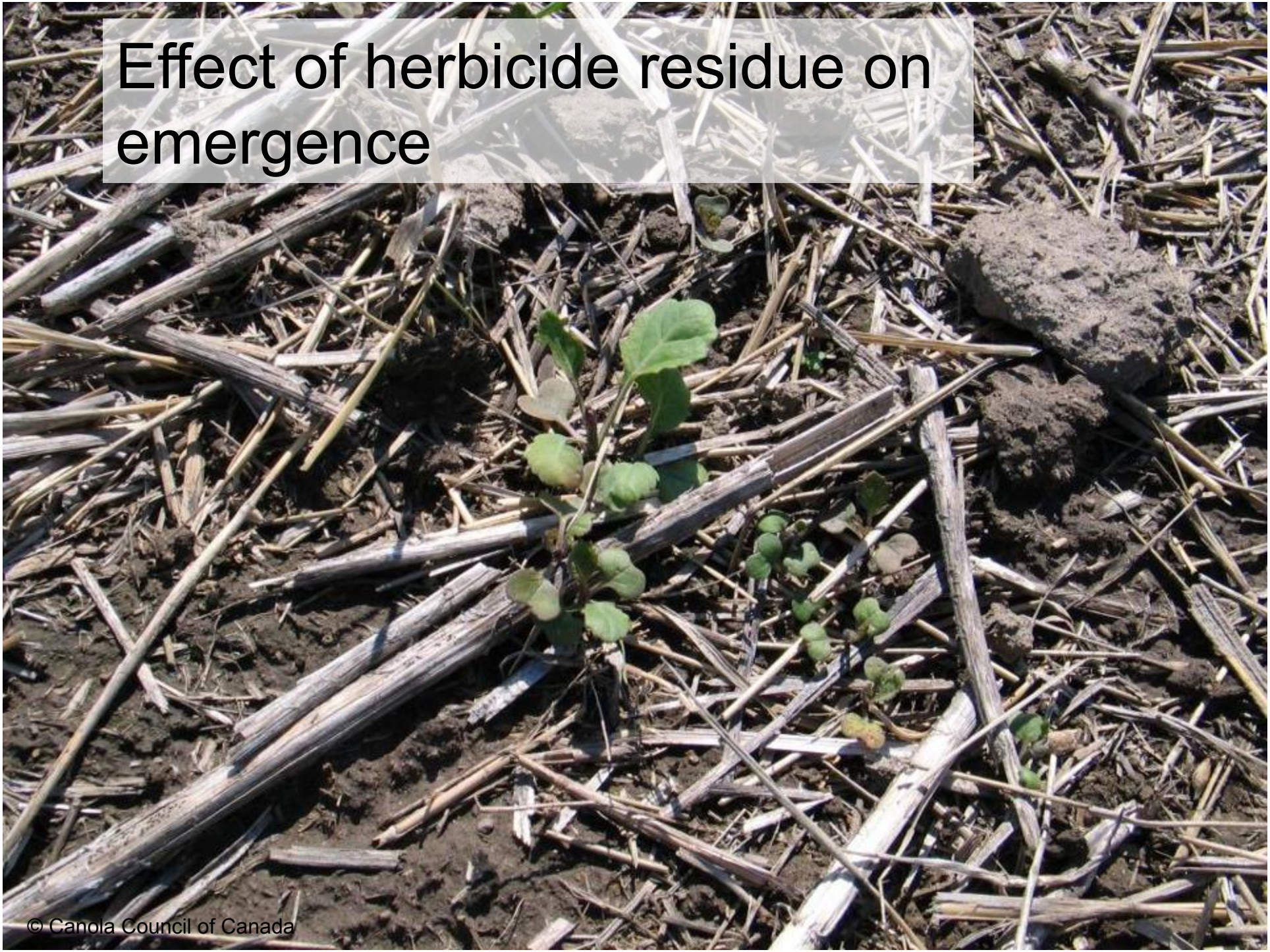
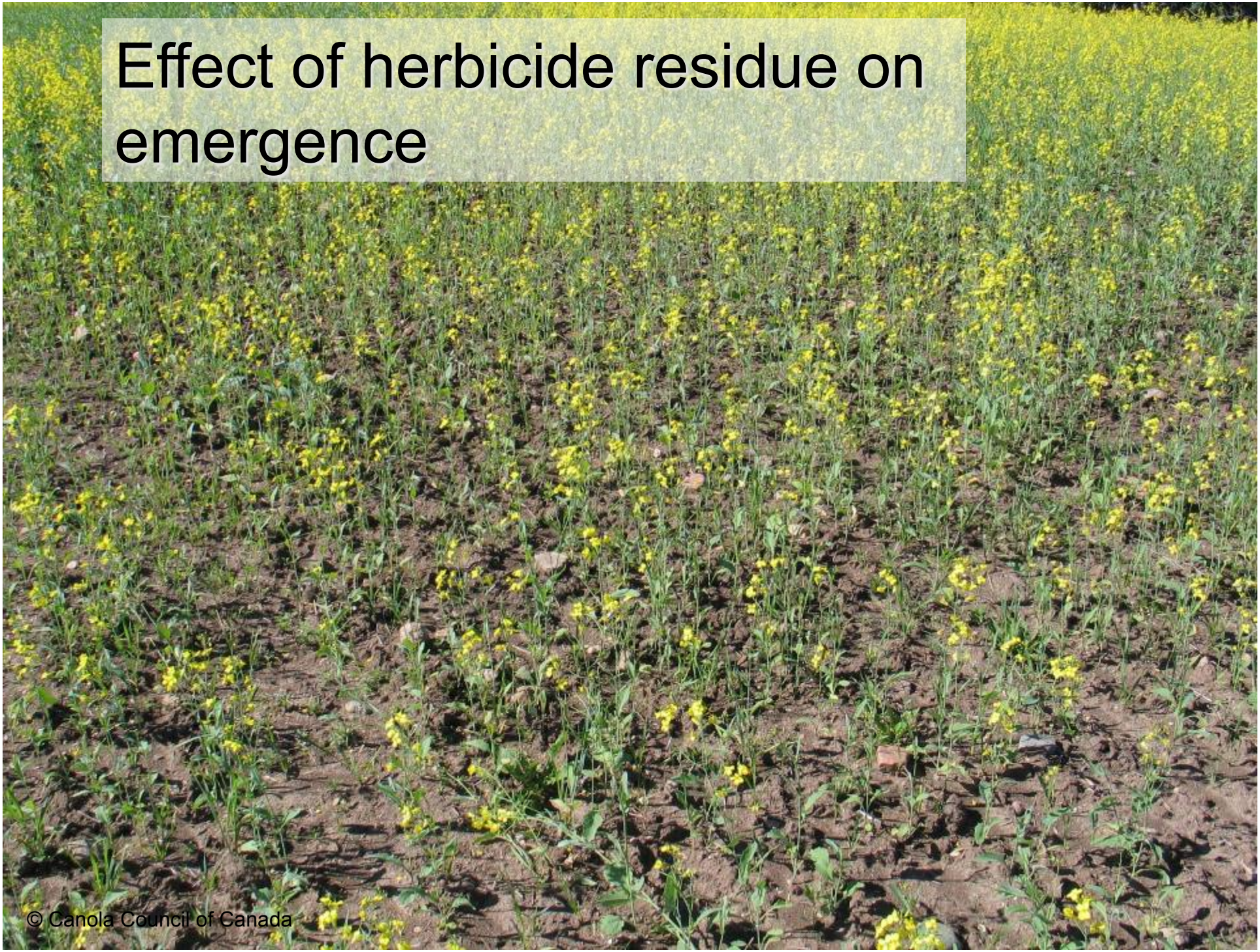
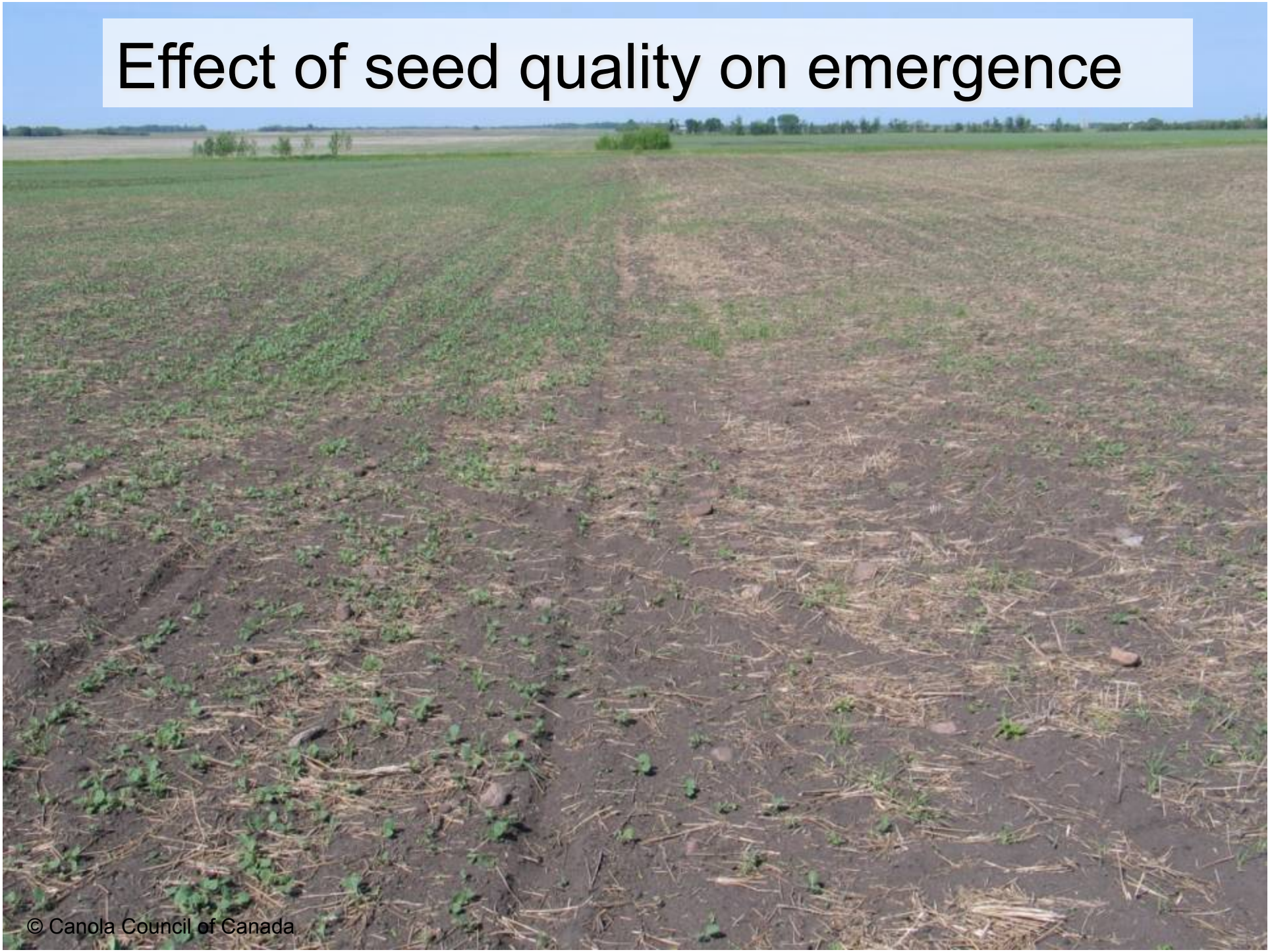


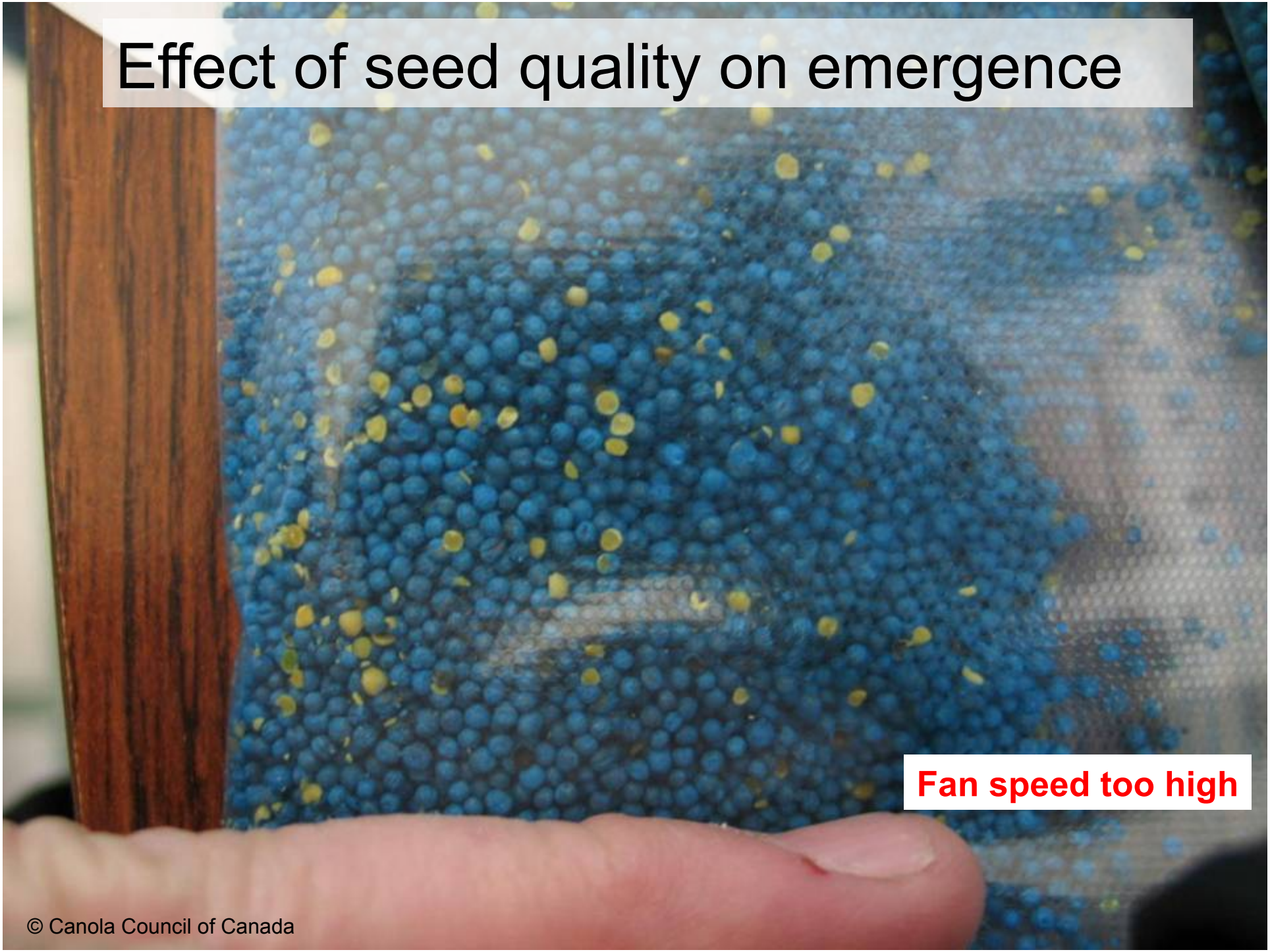
Effect of herbicide residue on emergence



Effect of seed quality on emergence

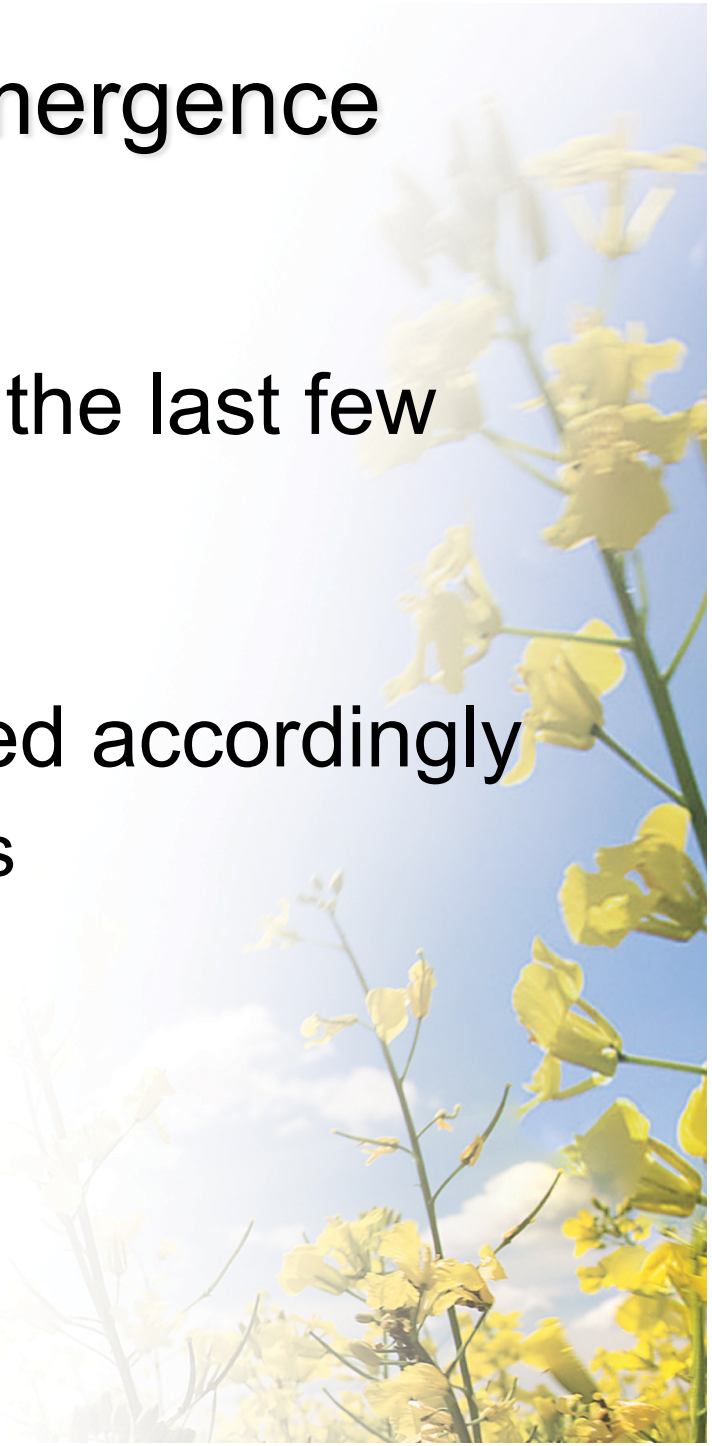


Effect of seed quality on emergence



Effect of seed size on emergence

- Seed size has increased the last few years
  - Due to hybrid adoption
- Seeding rates not adjusted accordingly
  - Leading to reduced stands



Seed Survival (%) = 40%

Thousand Seed Weight (grams)	Seeding Rates (lb/ac)					
	3	4	5	6	7	8
2.5	5.0	6.7	8.3	10.0	11.7	13.3
3	4.2	5.6	6.9	8.3	9.7	11.1
3.5	3.6	4.8	6.0	7.1	8.3	9.5
4	3.1	4.2	5.2	6.3	7.3	8.3
4.5	2.8	3.7	4.6	5.6	6.5	7.4
5	2.5	3.3	4.2	5.0	5.8	6.7
5.5	2.3	3.0	3.8	4.5	5.3	6.1
6	2.1	2.8	3.5	4.2	4.9	5.6

Seed Survival (%) = 70%

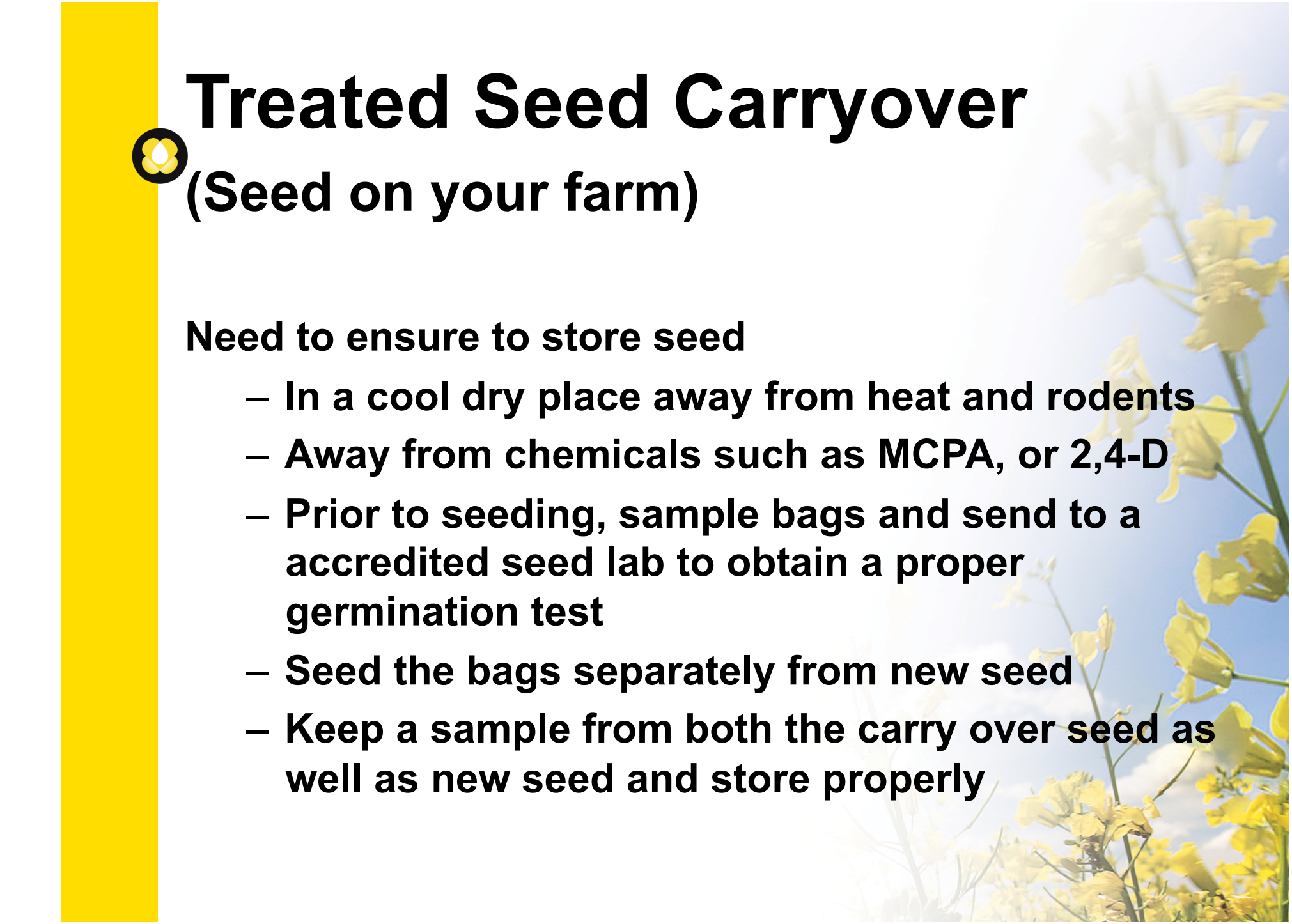
Thousand Seed Weight (grams)	Seeding Rates (lb/ac)					
	3	4	5	6	7	8
2.5	8.8	11.7	14.6	17.5	20.4	23.3
3	7.3	9.7	12.2	14.6	17.0	19.5
3.5	6.3	8.3	10.4	12.5	14.6	16.7
4	5.5	7.3	9.1	10.9	12.8	14.6
4.5	4.9	6.5	8.1	9.7	11.3	13.0
5	4.4	5.8	7.3	8.8	10.2	11.7
5.5	4.0	5.3	6.6	8.0	9.3	10.6
6	3.6	4.9	6.1	7.3	8.5	9.7

Effect of seed size on emergence

Seed Carry Over 2010-2011

Treated Seed Carryover

(Seed on your farm)



Need to ensure to store seed

- In a cool dry place away from heat and rodents
- Away from chemicals such as MCPA, or 2,4-D
- Prior to seeding, sample bags and send to a accredited seed lab to obtain a proper germination test
- Seed the bags separately from new seed
- Keep a sample from both the carry over seed as well as new seed and store properly

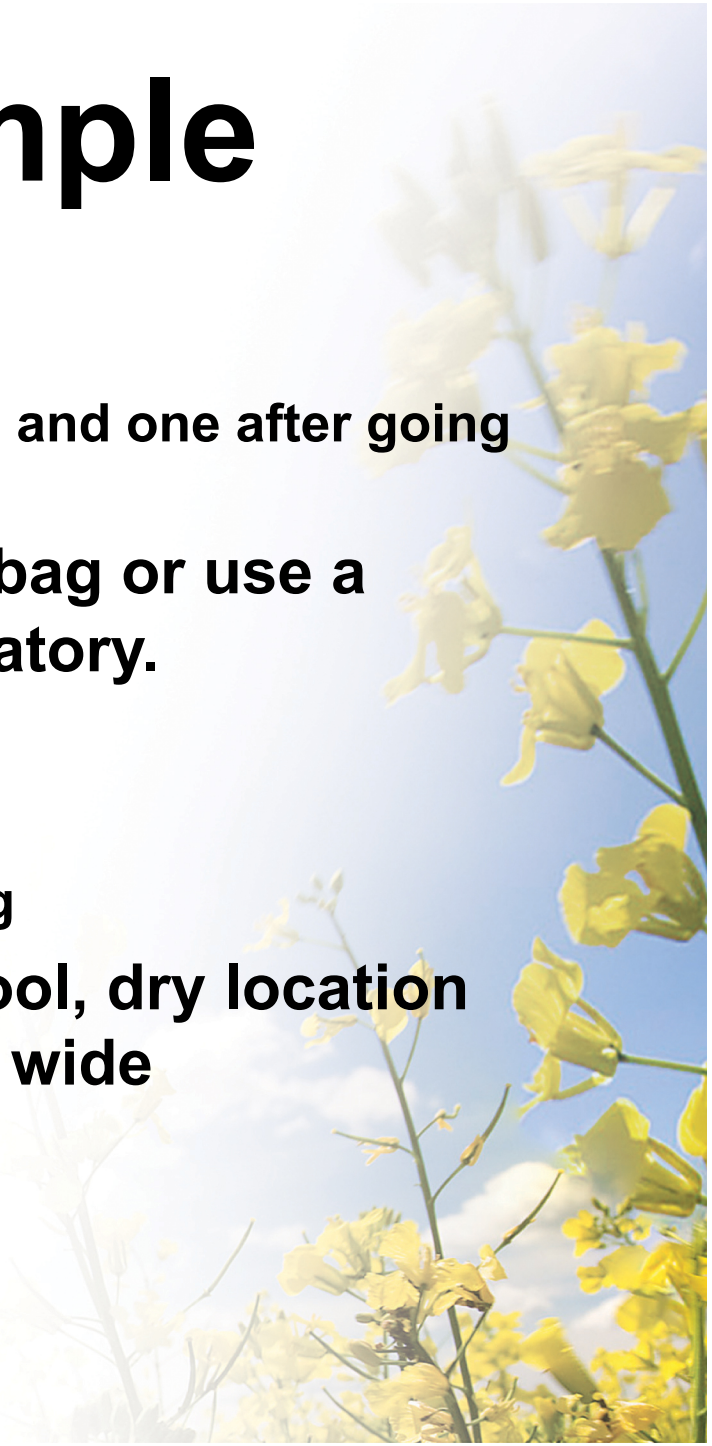
Treated Seed Carryover

(Seed coming from retail)

- Returned 2010 seed has been checked, retested and being stored in proper warehouse facilities
- All tests are conducted in accordance with CFIA/Seeds Act rules
- Seed Co's state they do every test possible to ensure you receive top quality seed next spring
  - All Co's use the standard germ test
  - Vigour tests vary between Co's

Keep a Sample

- Min 500g (2 cups) sample
  - of ALL crops sown on your farm
  - Or 2 samples = one bag prior to and one after going through drill
- Store the samples in a Ziploc bag or use a sample bag from a seed laboratory.
- Label the samples
  - with info of seed lot
  - or enclose blue certified seed tag
- Rodent proof container in a cool, dry location away from direct sunlight and wide temperature fluctuations."



Our Campaign

Seed SMART with these tips from the Canola Council of Canada

canola council

Yield losses can be avoided right from the start when you seed your canola. Follow these handy SEED SMART tips to help optimize emergence and ensure a more uniform stand to make the most of your canola seed investment.

Slow down
Measure depth
Aim for uniform stand
Remember to take a sample
Target 10 plants/ft²

Slow down

Slowing down while seeding allows for accurate seed placement and proper separation of seed and fertilizer. Consider fan speed as well – higher application rates and/or seeding speeds often require higher fan speeds to avoid plugging but this can increase seed damage and seed bounce. Make sure to adjust dampers and fans on the seed distribution part of your seeding system as recommended in order to minimize this damage.

Measure depth

Prior to seeding, level your drill from side to side and front to back. Once in the field, measure seed depth across the drill runs at least 100 feet behind the spot you stopped to ensure measurement of seed depth at your actual seeding speed. Check depth regularly in a field and as you move from one field to the next.

Aim for a uniform stand

A non-uniform stand, as pictured on the left, can result in a 20% yield loss as compared to a uniform stand, even in a normal growing season. A uniform stand results in more even crop staging, making pesticide applications and swathing timing easier to stage.

Remember to take a sample

Keep a sample in a paper or cloth bag from each variety and seed lot that you seed. Record relevant information, keep the seed bag blue tag with the sample, and store all samples in a cool, dry place.

Target 10 plants/ft²

Select your seeding rate using the following formula, which accounts for differences in Thousand Seed Weight (TSW) of different seed lots.

Seeding Rate (lb/ac) = (9.6 x Desired Plants per ft² x TSW)/Estimated Seed Survival

Soil temperature should be at a minimum of 5°C before starting to seed canola. After emergence, take time to assess the stand so you can implement appropriate management techniques to protect the stand that is there.

canola council

For more tips on canola seeding, visit **www.canolacouncil.org**.